

321 CONTACT®

An Amazing Collection

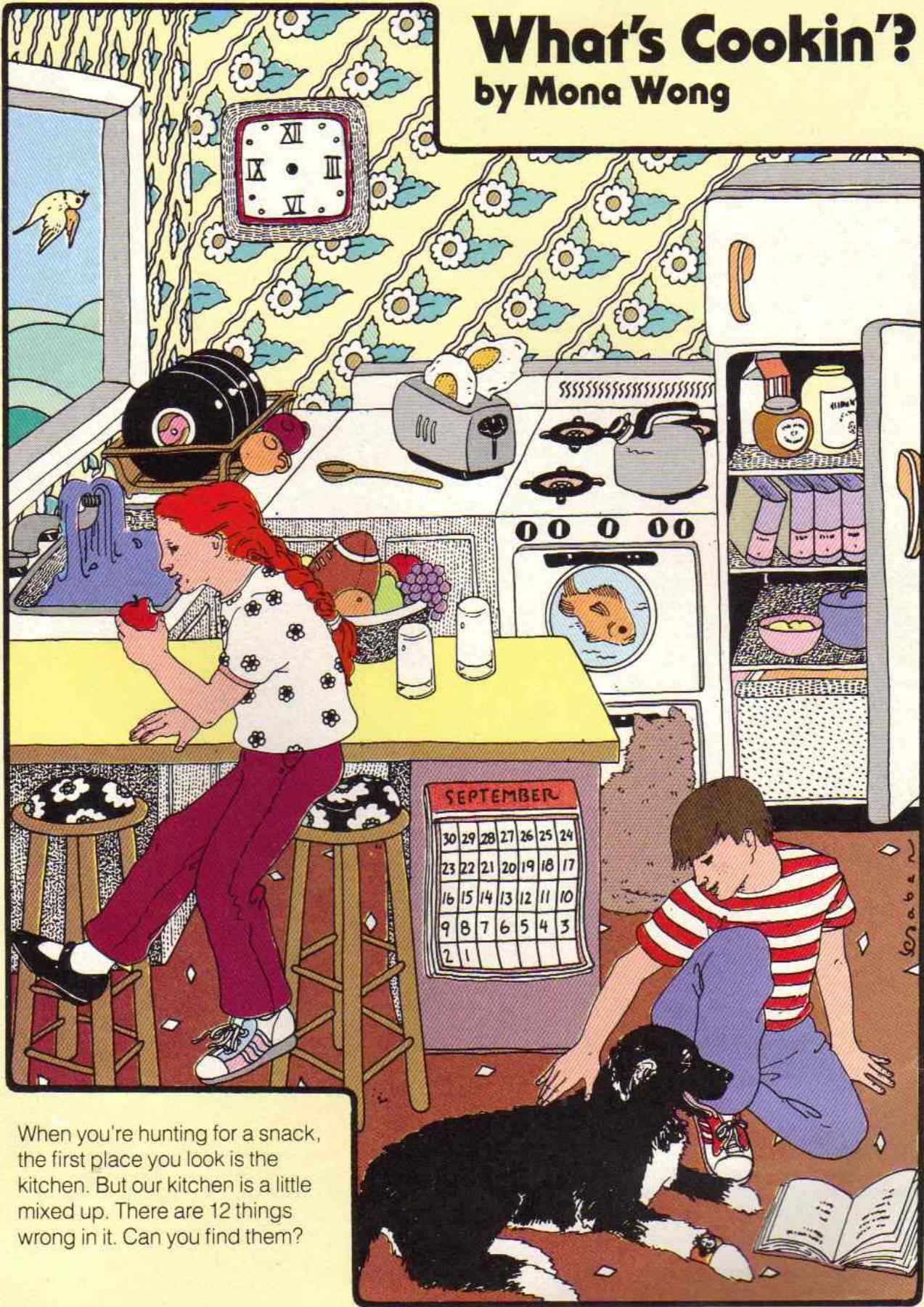


What's Wrong
Here?

Including
ONLINE
Computer News • Games
Software Reviews
Programming

What's Cookin'?

by Mona Wong



When you're hunting for a snack, the first place you look is the kitchen. But our kitchen is a little mixed up. There are 12 things wrong in it. Can you find them?

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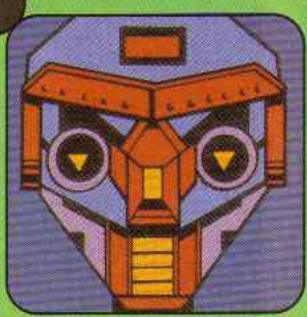
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Cover Photo
Courtesy of the Smithsonian Institution

ENTER: The High-Tech World of Computers

Coming Attractions

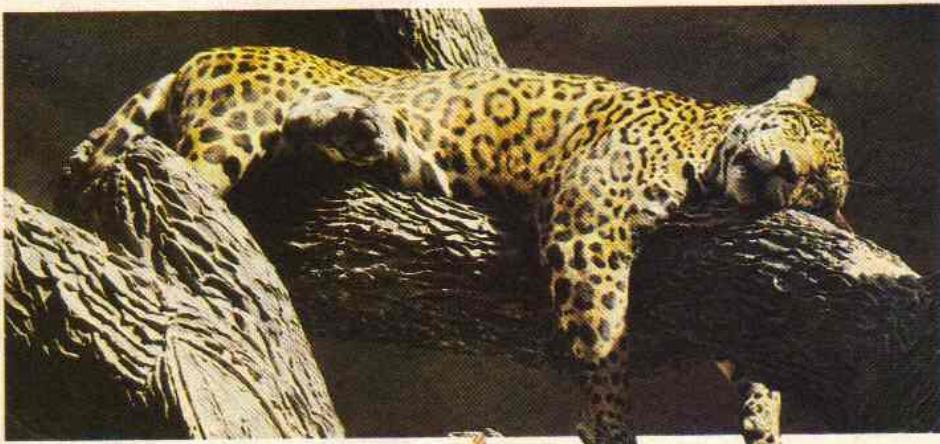


PHOTO © M. AUSTERMAYER/ANIMALS/ANIMALS

Cat News

There's good news for animal lovers everywhere—and for jaguars who live in Belize, a nation in Central America. A forest reserve there will become the home for about 40-50 jaguars.

The new reserve will protect the big cats from hunters and farmers. Until now, the jaguars have been killing cattle on ranches near the reserve. So ranchers were forced to shoot the big cats. Also, the jaguars' feeding grounds have gotten smaller as farmers move into the area.

But now the jaguars will be safe in their new home.

The Comet Is Coming!

People are getting ready to celebrate a special event in December and March. That's when Halley's comet will make its once-in-every-75-year visit to the neighborhood of the Earth.

Spacecraft are already speeding through space in order to study the comet. The craft will see how close they can safely get to the comet, and will take photos to be studied on Earth. Watch for more comet news in CONTACT.

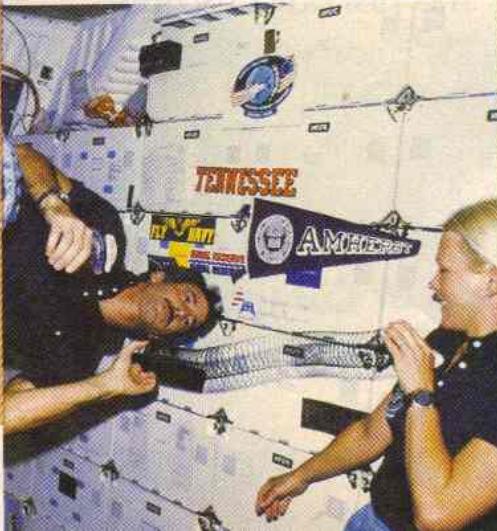
Toys in Space

Slinky, the spring-like toy, has stepped into outer space. During a recent mission aboard the space shuttle Challenger, a Slinky, a yo-yo, a top, a wind-up toy and two tiny cars were brought along as part of an experiment.

Astronauts were filmed playing with the toys on Earth and then playing with the toys in space. Researchers want to find out the effect of weightlessness on these common objects.

There was only one problem with the experiment. According to NASA, the astronaut crew had to "fuss and fight over who got what toy."

PHOTO COURTESY OF NASA



A Card Trick

If you've ever lost your library card, you'll understand the problem faced by the New York Public Library. This library uses 35 million cards to keep track of all its books. But some cards are so old that they're turning to dust.

The library hopes to solve this problem by creating a computerized card catalogue called the On-line Catalog. With this system, people will be able to use the library computer to locate books faster than ever.

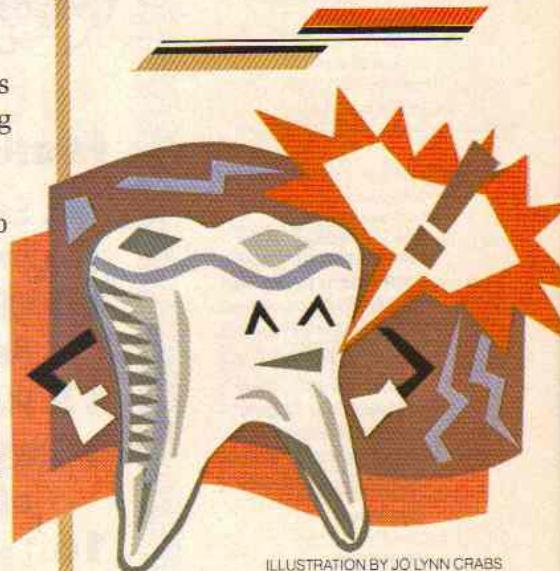


ILLUSTRATION BY JO LYNN CRABS

...And That's the Tooth!

The truth is on the tooth.

That could be the slogan for Micro ID of Peoria, Illinois. This company has designed a microchip that will contain information about a person's medical history, address, telephone number and other personal facts.

The special chip can be attached to a person's back tooth. If a person is hurt or unable to talk, the microchip will be there to tell the truth, the whole truth and (almost) nothing but the tooth.

ILLUSTRATION BY BEN HILLMAN



Cool Conversations

Penguins pay attention! Antarctica—the place where the South Pole is located—should soon be hooked up with the rest of the world. And scientists are thanking an orbiting satellite.

NASA, the U.S. space agency, plans to use a satellite to make it possible for South Pole research stations to communicate with the rest of the world.

Setting up other kinds of communication would be much more difficult, according to NASA engineer Michael Comberiate. South Pole weather conditions pose the main problem: temperatures plunge to 120 degrees below zero and winds whip at speeds up to 200 miles (317 km) per hour.

"The satellite project could bring about a major change in communications in the region," says Comberiate. Right now, information collected at the South Pole in the winter must be stored until summer. Then it can be flown out by airplane. And everyone knows penguins hate to fly.

Seeing Yellow

You may be seeing more fire engines painted a greenish yellow in the future. According to an eye doctor, Stephen Solomon, red fire engines get into more accidents than yellow ones.

Solomon says that the eye is more sensitive to greens and yellows, so vehicles painted this color stand out more. This may help alert drivers to oncoming fire engines—and may help avoid collisions.

Not everyone is fond of Stephen Solomon's idea. The Dallas, Texas, fire department has switched back from greenish yellow trucks to red. The reasons: Fire fighters have found that red paint is easier to touch up and lasts longer. Besides, the Dallas fire department says its fire fighters just feel better about traditional red.



PHOTO: SAHA GAY DAMMAN/THE NEW YORK TIMES



Jumping for Dollars

Wendy Johncheck of Petoskey, Michigan, is a girl who thinks big. For an extra-credit school project, Wendy, 12, invented a four-way jump rope. It requires only four kids—rather than eight—to twirl it.

Wendy braided ropes out of twine. She then attached them to a post that could be placed in the ground. Wendy figured that she'd just get a grade.

But her teacher and classmates had other ideas. They invented a slogan for the rope—"Jump a bunch with Quadro Jump." Then the kids wrote letters trying to sell Wendy's idea to a company. It worked. Wendy's invention is being featured in 250,000 catalogues that go to playgrounds and schools around the world.

ILLUSTRATION: PAT CUMMINGS

So What's New?

You tell us and you'll get a nifty CONTACT T-shirt—if we print your story. Send us any science stories that have to do with the future (which could even be next week!). Send stories to: Coming Attractions P.O. Box 599 Ridgefield, NJ 07657

Amazing Stuff!

by Jim Lewis **EXPLORING A MUSEUM WITH 100 MILLION INCREDIBLE OBJECTS**

Collect your thoughts.

Okay, now tell us: What do you like to collect? Stickers? Stamps? Records? Rocks? Dolls? Autographs? Copies of 3-2-1 CONTACT?

Chances are you collect something. From toasters and posters to punch bowls, pennants and pennies, kids and adults everywhere are putting together amazing collections.

What's the most amazing collection? That's tough to say. But we'd bet our entire set of purple popsicle sticks that it's the collection of the Smithsonian Institution in Washington, D.C. Inside its 12 museums and its zoo, the Smithsonian has:

- 4,500 meteorites
- 2,500 zoo animals
- 7 million beetles
- 125 sewing machines
- 6,214 African masks
- 30,834 costumes
- 77 spacecraft
- 35,594 skeletons
- 12 million postage stamps

And that's just the beginning. All together, the Smithsonian museums have more than 100 million objects! To get the inside story about this incredible collection, CONTACT talked with the people in charge of gathering all this great stuff—the Smithsonian's curators. We discovered that many of these curators started their collecting careers as kids.

"My family thought I was going to become a junkman," recalls John White, the person in charge of the Smithsonian's transportation section. When John was a boy, he used to go to the junkyard with his uncle Bill. They would come back with gears and pieces of machinery.

John didn't become a junkman, but he's still collecting odd pieces of machinery. Today, his museum's collection includes an Indy 500 race car, three streetcars and a 280-ton locomotive.

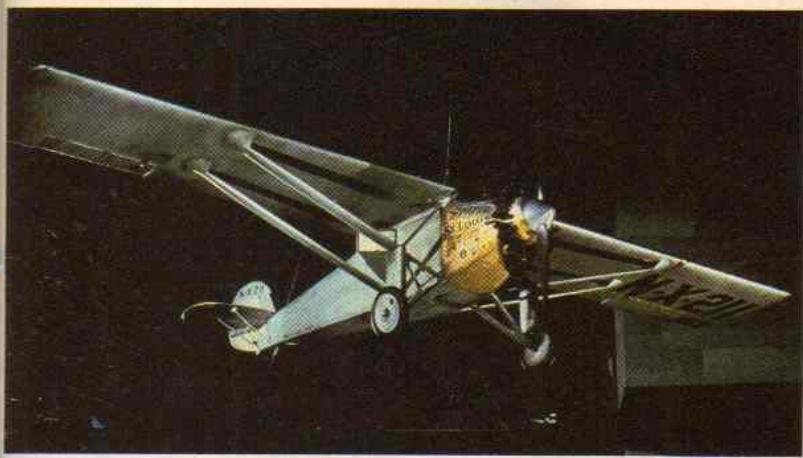
"You can learn a lot when you begin to collect things," says John. You learn about an item's history, how it works and about all the ➤



By George! What Washington Wore



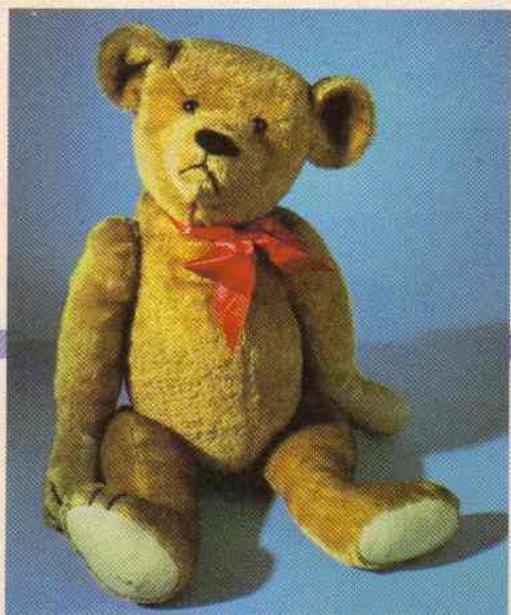
At the Zoo: Lions and Tigers and Bears!



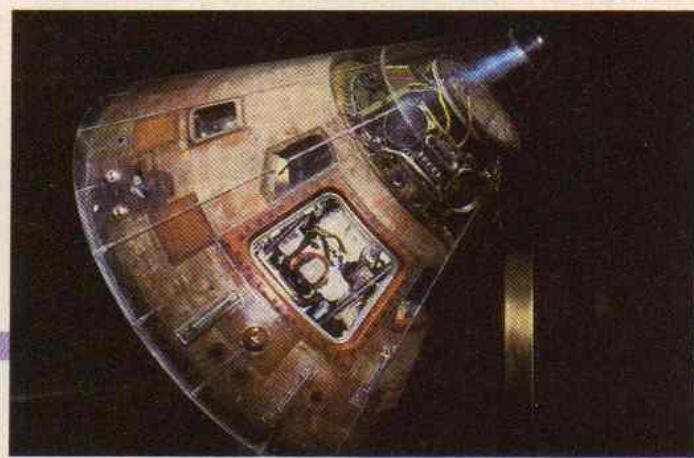
Transatlantic Flyer: Lindbergh's Plane



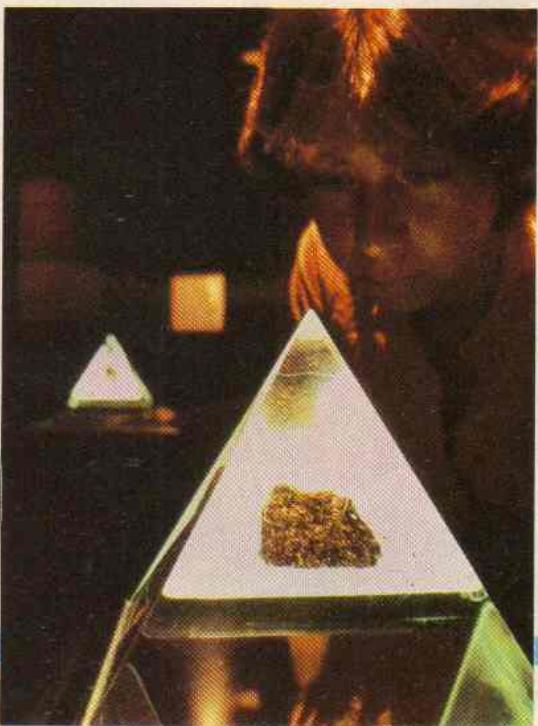
Soccer Superstar: Pele's Play Clothes



Hugs! One of the first Teddy Bears



First to the Moon: Apollo 11 Capsule



Out of this World: A Moon Rock

PHOTOS COURTESY OF THE SMITHSONIAN INSTITUTION



What's Wrong? A misprinted upside down airplane makes this 24¢ stamp worth more than a million dollars!



Bugs! A Collection of 7 Million Beetles

types of objects that fall under that category. And, he adds, you learn the first lesson of collecting: "No matter how big your collection gets, you can't collect everything."

That's true even for the Smithsonian. "It's sad when we're offered something wonderful and have to turn it down," says John White. "I can't tell you how many locomotives we've had to refuse—but there's just no room!"

How do the Smithsonian curators decide what they can collect? "It might surprise you," John White says, "but we don't always look for the biggest or the fastest things. In fact, we try to collect what's most ordinary. We want things that are common, that can show us what life was like at a certain time in history."

Carl Scheele agrees, even though a lot of objects in his collection are out-of-the-ordinary. As head of the Smithsonian's Community Life section, Carl's collection includes the ruby slippers worn in *The Wizard of Oz*, Hank Aaron's baseball bat and Fonz's leather jacket from the TV show *Happy Days*.

"These objects are part of the American experience," says Carl. "They could help people a hundred years from now understand what everyday life was like for us."

Collectors in Space

Since today's everyday life includes trips into space, we visited David DeVorkin at the Smithsonian's Air and Space Museum. He collects some very extraordinary spacesuits, satellites and rockets.

"What we try to do here is to keep track of our space history," says David. "We're looking at today's technology and trying to imagine what future generations will be interested in." David, who collected telescopes when he was a boy, is the head of the Smithsonian's space science and exploration section.

His collecting is made easier thanks to NASA, the U.S. space agency. Whenever NASA is finished with a spacecraft or spacesuit, they ask if the Smithsonian wants it. David and his staff use what they know about space age technology to decide whether or not an object fits into their collection.

"We're very interested in items that were part

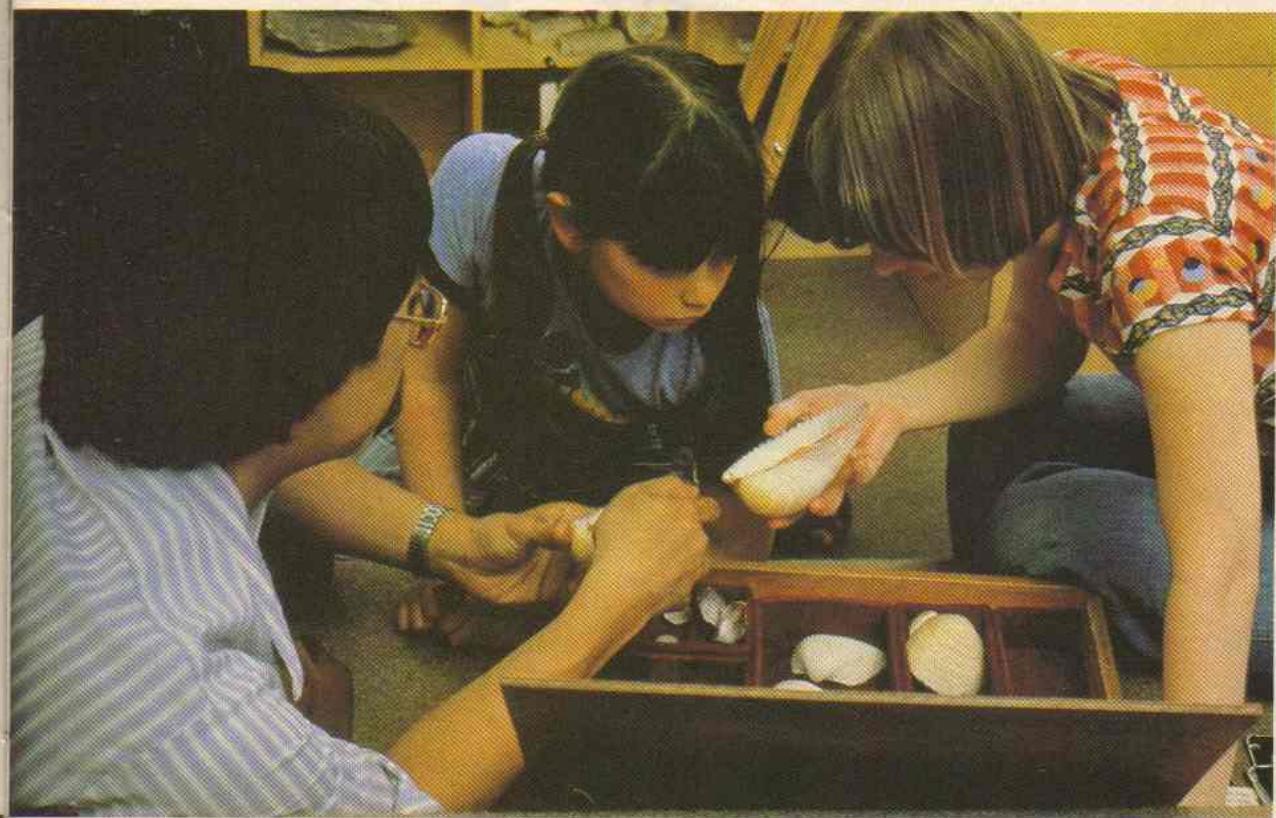
Right: From home runs to space shuttles: Janice Hill started by collecting baseball cards. Today she keeps track of the Smithsonian's satellites, moon rocks and rocket ships.

of a history-making event," explains David. For instance, they have the Mercury space capsule that astronaut Alan Shepherd flew as the first American in space. When people come to the Air and Space Museum and see that, they feel a little closer to that event in history, explains David. "It's the same feeling you get when you look at another important Smithsonian display—the Wright Brothers' airplane."

Where's That Rocket?

Although the Smithsonian tries not to collect every rocket and airplane that comes along, the Air and Space Museum still has an enormous problem storing its 29,000 piece collection. If you want to know where anything is, you have to ask Janice Hill. Janice started collecting baseball cards when she was eight years old. Today she helps collect and keep track of all the rockets, airplanes and flying machines at the museum.





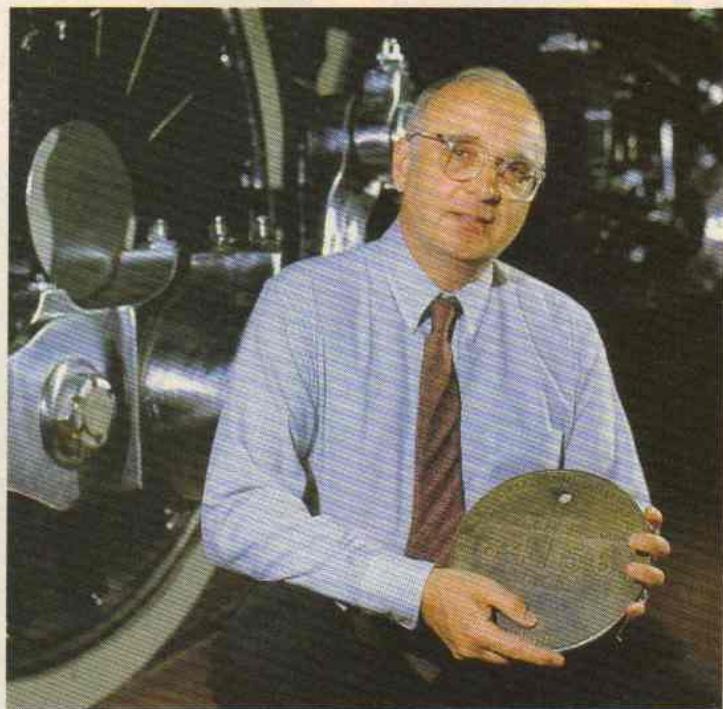
Left: These shells are swell. And so are the 5,905 crayfish, 114,429 bird eggs, 8,000 turtles and millions of other odd objects the Smithsonian collects and displays in Washington, D.C.

She also helps decide where to store everything. That can be an enormous problem. For instance, the Smithsonian has three Saturn V rockets, like the ones that sent astronauts to the moon. Each of these rockets is almost as tall as the Washington Monument! "We have no place to keep them here in Washington," admits Janice. So these Saturn V rockets must be stored at the Kennedy Space Center in Florida, the Johnson Space Center in Texas, and the Space Center in Huntsville, Alabama. And that's not the only big problem. The museum also has to store more than 380 airplanes at airfields in Tucson, Arizona and in Suitland, Maryland.

"We could easily fill three or four more Air and Space Museums with the collection we have," says Janice. Instead, her museum (and other parts of the Smithsonian) lend a lot of their collection to smaller museums—just as you might lend part of your collection to a friend.

All in all, keeping a collection can be a lot of work. At the Smithsonian, says Janice Hill, it's worth all the work. "We're keeping a collection for everyone," she notes. "This collection doesn't belong to us, it belongs to the people."

That gives Janice a good feeling. Almost as good as when she finds an old Detroit Tigers card. You see, Janice Hill is still crazy about baseball card collecting.

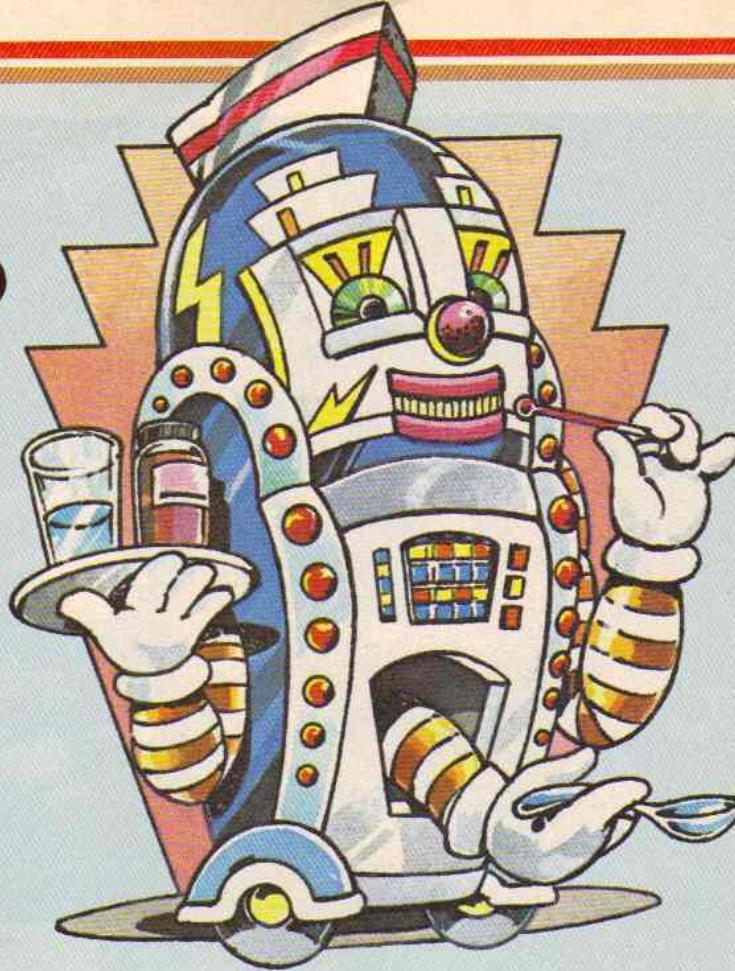
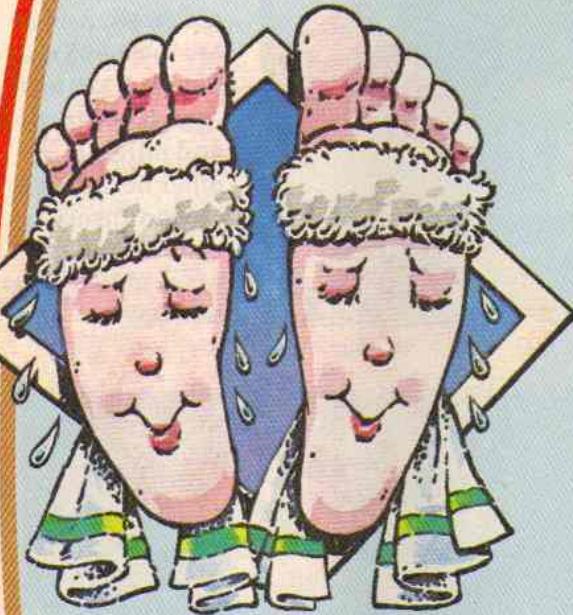


PHOTOS COURTESY OF THE SMITHSONIAN INSTITUTION

"You can't collect everything," admits John White, who collects trains and trucks for the Smithsonian. "I can't tell you how many locomotives we've had to refuse—just no room!"

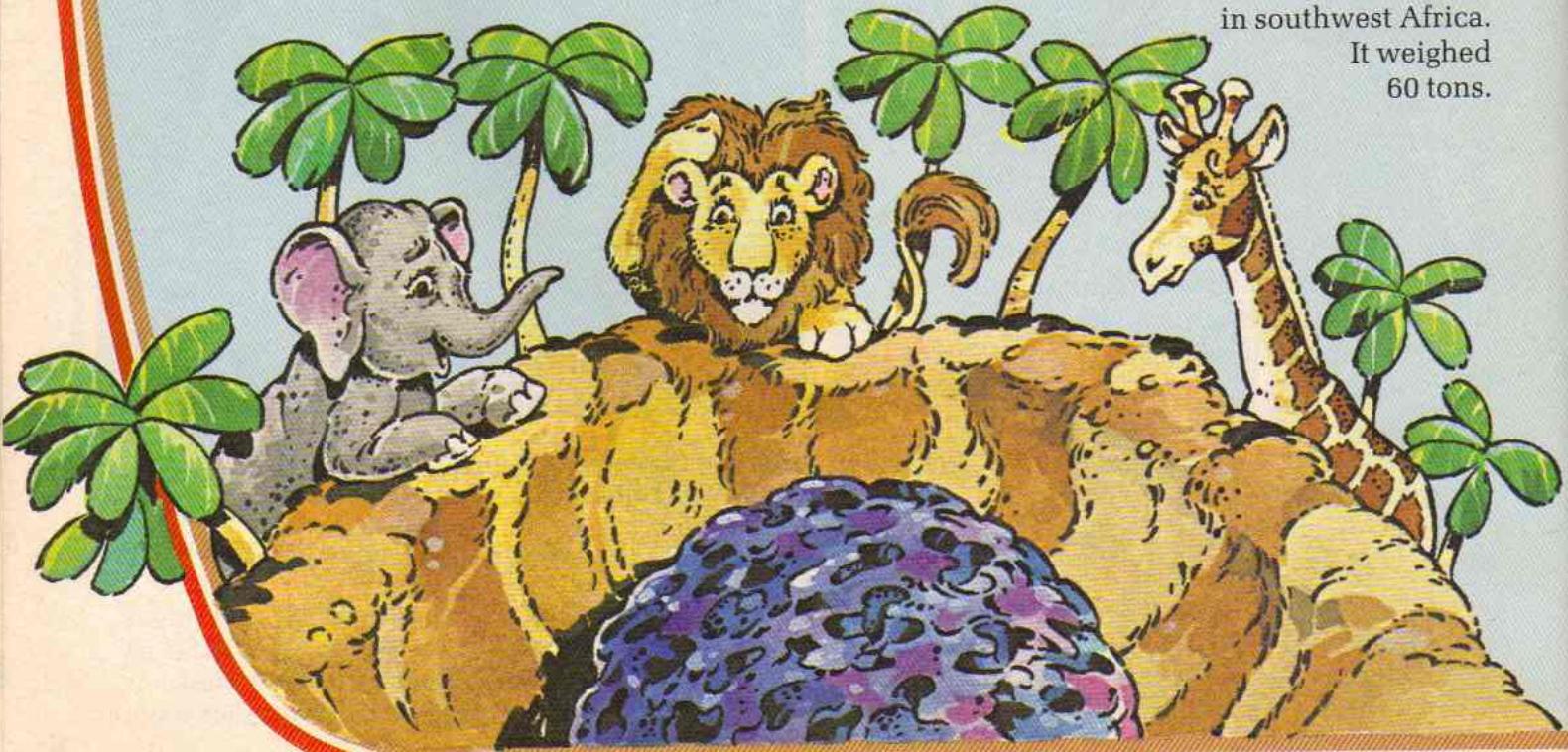
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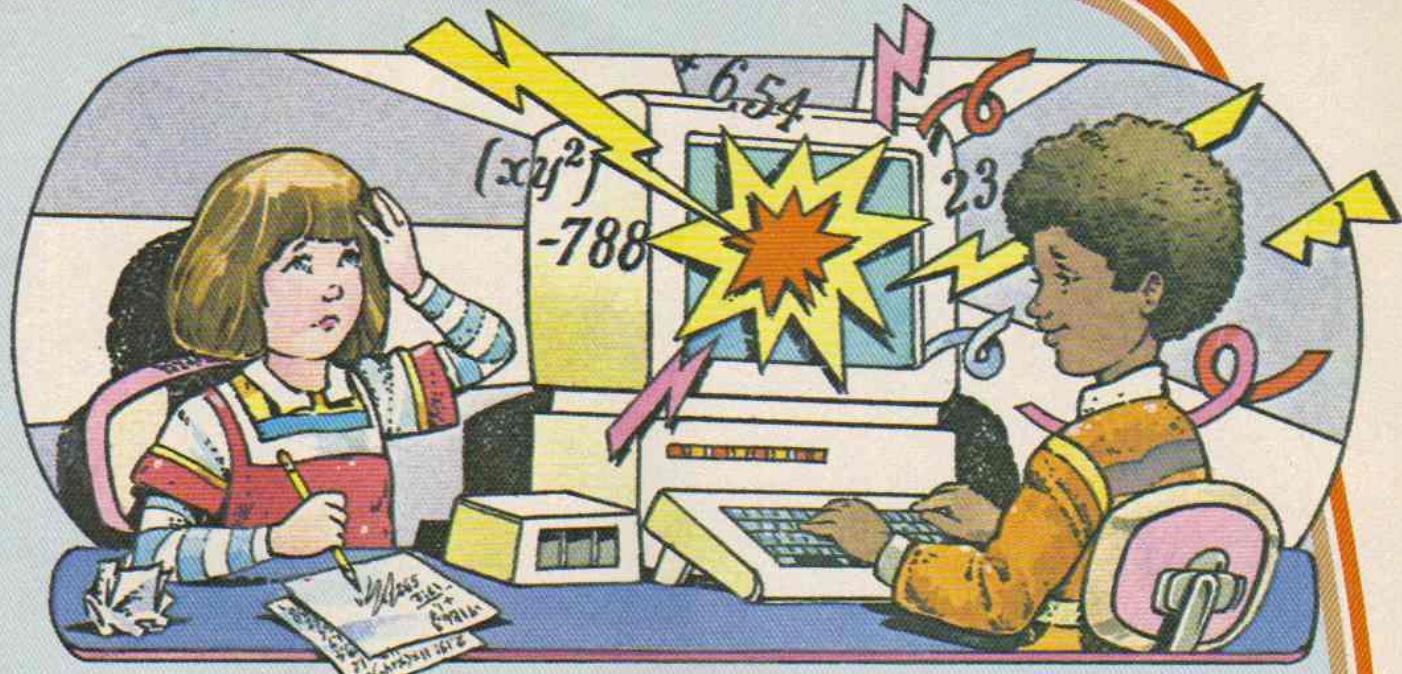
Your feet give off about one cup of perspiration every day.



Some hospitals in Japan are using robot nurses.

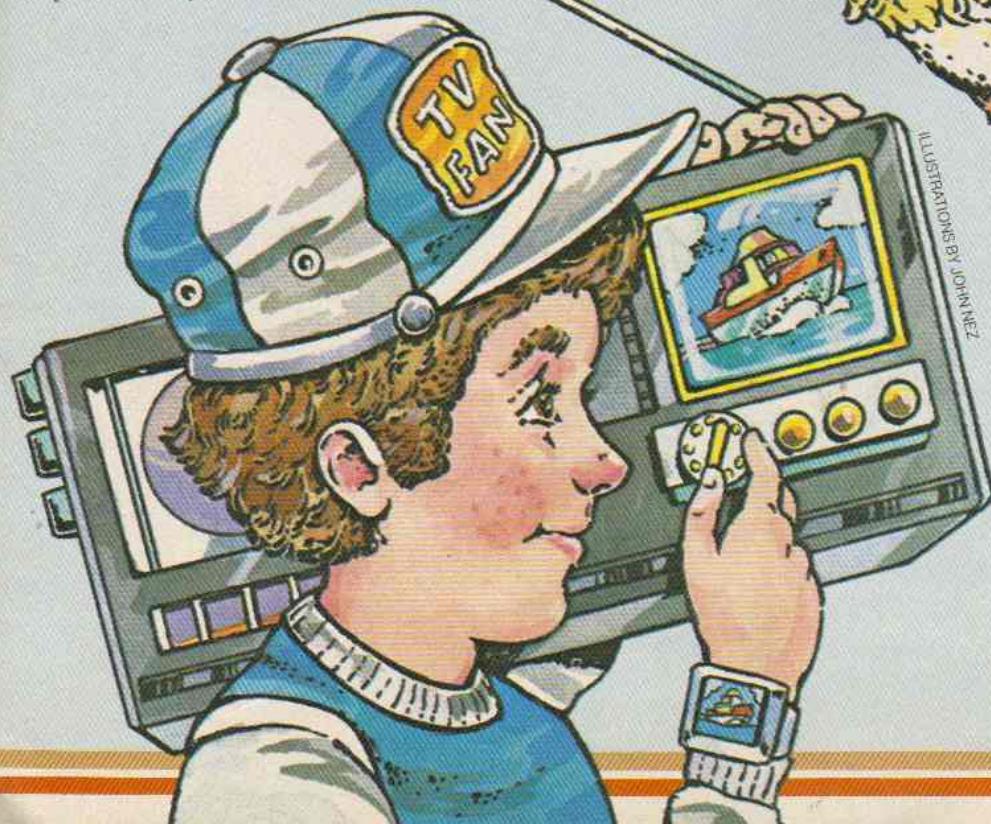
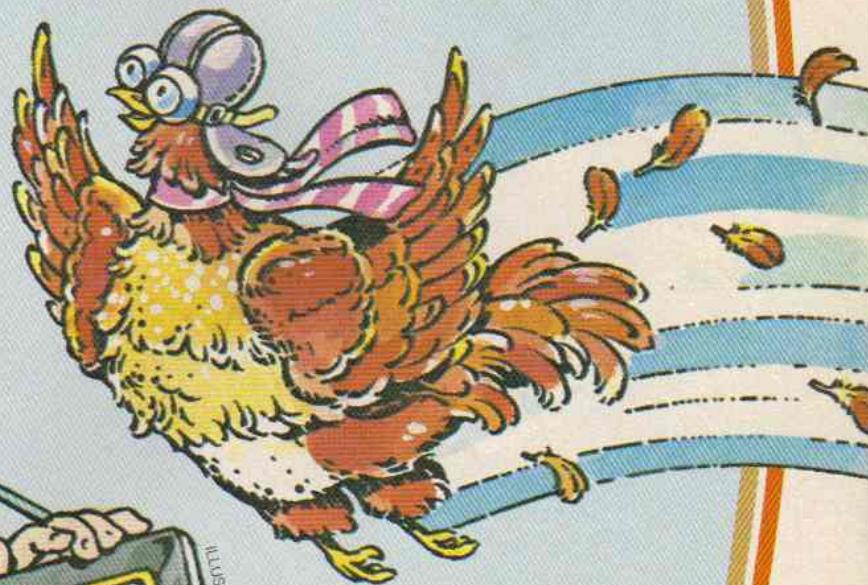
The biggest known meteorite to fall to Earth landed in southwest Africa. It weighed 60 tons.





The world's fastest computers can do one billion arithmetic problems a second.

The longest recorded flight by a chicken was 302 feet, eight inches.



Last year, the average American watched 968 hours of TV. That comes to just over 40 days.

UFOS ARE THEY FOR REAL?

by Ken Wilson



On November 2, 1972, a high school student named Ronald Johnson was tending sheep on the family farm near Delphos, Kansas. It was just after dark.

As Ronald headed in for dinner, he saw something that made him forget all about food. Just beyond the house, he saw a "glowing, mushroom-shaped object." It was hovering two feet above the ground. It roared loudly. Ronald watched the object for several minutes. He was afraid to stay, but too fascinated to run. Suddenly, the

sound changed to a loud whine. The object then took off into the night sky. The bright flash of lift-off left Ronald temporarily blinded.

What you have just read is a famous story about UFOs—Unidentified Flying Objects. Did this thing happen? Maybe. But what happened? Was this "sight" a spaceship, or was it an optical illusion? And finally, what does this story mean? Does it prove anything?

Those are the kinds of questions that UFO



BUCCELLA

investigators try to answer. Every year, thousands of UFOs are sighted around the world. A "sighting" doesn't mean a flying saucer was spotted. It means someone saw a strange light or object he could not immediately identify.

Most scientists think these sightings usually can be explained. They have discovered that UFOs often turn out to have been reflections from the sun, evening stars, swamp gases, or even flying birds. These scientists want *physical proof* of visitors from another planet. Then, and only then,

will they admit UFOs could be visitors. These scientists are called "UFO skeptics."

A True Believer

Other scientists and writers disagree. They believe it is possible that an unexplained UFO was really a ship from space. Few of these UFO believers say that we definitely have been visited. But they do say unexplained flying objects make them wonder.

Dr. J. Allen Hynek is one of the best-known believers. He is an astronomer and the director ➤



Left: Some UFOs can easily be explained. This odd-looking object above the trees turned out to be a cloud. These strange-shaped clouds appear in hilly countries like Norway, where this photo was taken.

of the Center for UFO Studies in Chicago. He has spent more than 25 years studying UFOs.

"Most sightings can be explained," Dr. Hynek admits. "Usually people are seeing things like weather balloons, meteors or satellites. But there are cases—as many as 10 per cent of the sightings—that we can't explain."

Dr. Hynek says that UFO reports often come from "serious" people. He notes that some have even taken lie detector tests to prove they did not "make up" their stories. Hynek also points out that physical proof has been found in places where UFOs were supposed to have been. This evidence includes things like burn marks on the ground or strange chunks of metal. Some of it, says Hynek, is convincing.

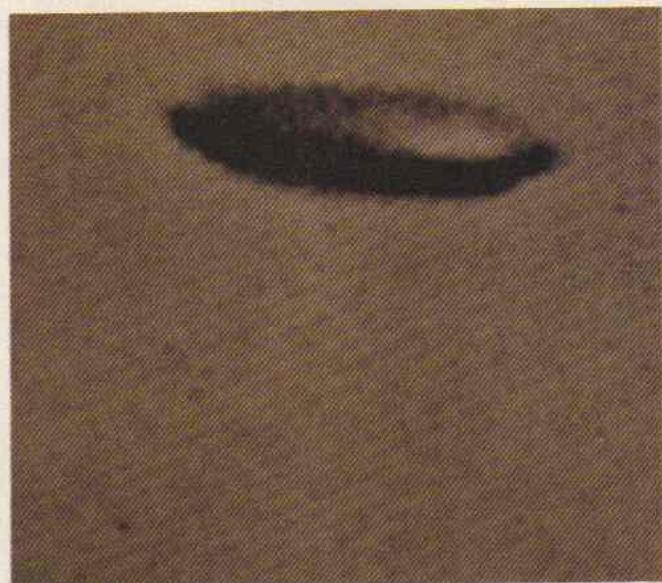
Astronomer John Mosely has a different opinion. "Eyewitnesses, no matter how serious they are, just aren't reliable. When they see something that's strange, they sometimes get carried away in all the excitement. They stop thinking logically. In many cases, witnesses change their stories later on."

No Real Proof

Mosely, like many other skeptics, claims that no really convincing evidence has ever been proven to have come from a UFO. "Every burn linked to a UFO landing could have been made by gasoline and matches," he says.

Both believers and skeptics agree on one thing: it is possible that there is life in outer space. But while believers say that this is proof that UFOs could have been here, skeptics still wonder.

The argument will probably go on for a long



Above: This UFO remains unidentified. Warren Smith and some friends were returning from a camping trip in Canada when they saw this "saucer" in the sky. No one has yet explained what it was.

time. UFO believers will continue to point to the story of Ronald Johnson and the thousands of others who say they've seen UFOs. Skeptics will keep saying that without proof, UFO stories are just that—stories.

The Right Stuff: Whether or not you believe in UFOs, there's a lot of outer (and inner) space to explore in CONTACT. On the following pages, wander into an amazing space maze, then journey to the center of the Earth. Want more? Turn to Newsbeat for the hottest in science fiction computer software.

Planet Maze

The aliens are trying to find their way home. Help them get to the capital city of their planet. Guide their rocket ship to the end of this space-y maze. Answer on the Did It! page.



ILLUSTRATION © DANIEL PELAIN

Journey to the Center of the Earth

by Phyllis Keaton

If you took a trip to the center of the earth, what would you find? No one is really sure.

Over 100 years ago, Jules Verne wrote a science fiction book, called *Journey to the Center of the Earth*. It told about the adventures of Professor Lindenbrook, his nephew Axel, and their guide named Hans.

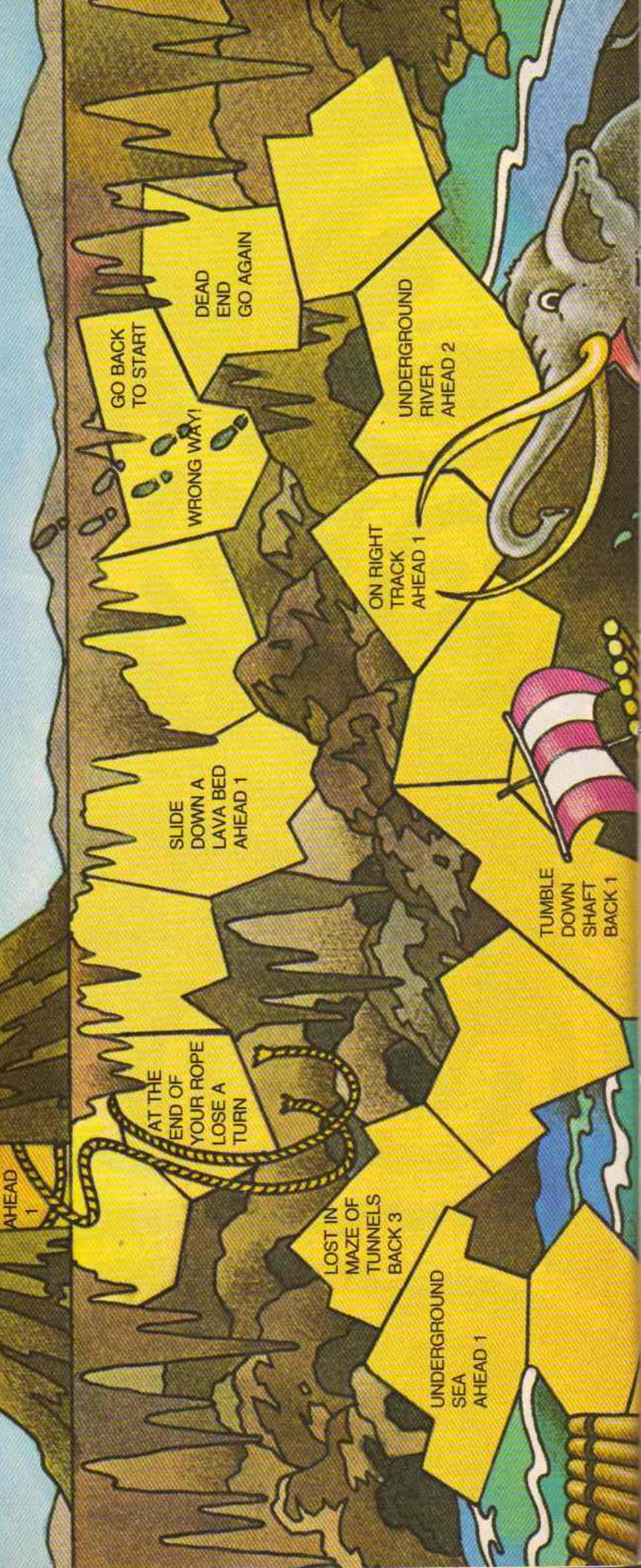
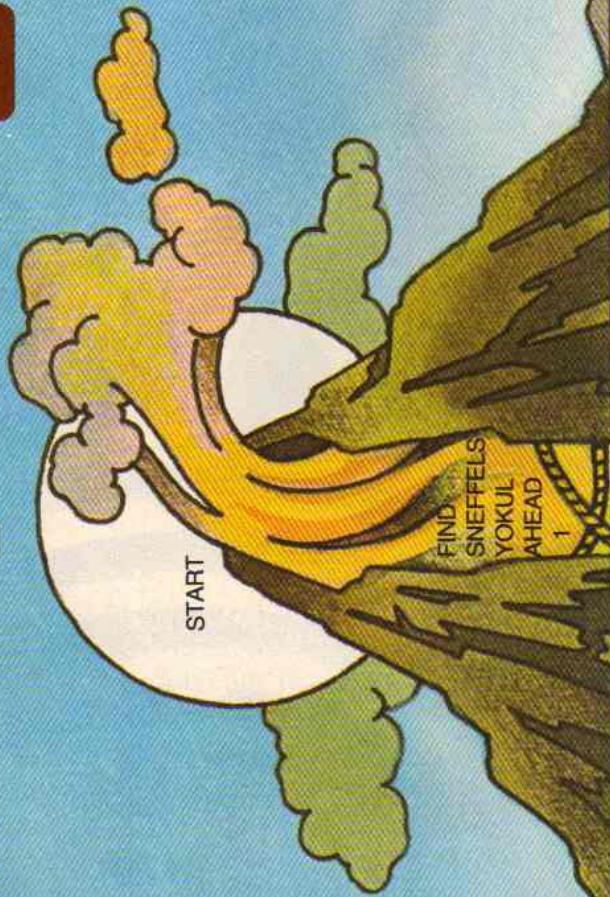
The professor had discovered a weird message he was sure would get them to the earth's center. It said: "Descend into the crater of Snejfels

Yokul, over which the shadow of Scartaris falls before the Kalends of July, bold traveller, and you will reach the center of the earth."

When you play this game, many of the same things that happened to the professor on his journey will happen to you.

How to Play

1. Use buttons for playing pieces.
2. Use one of two dice to move around the board.

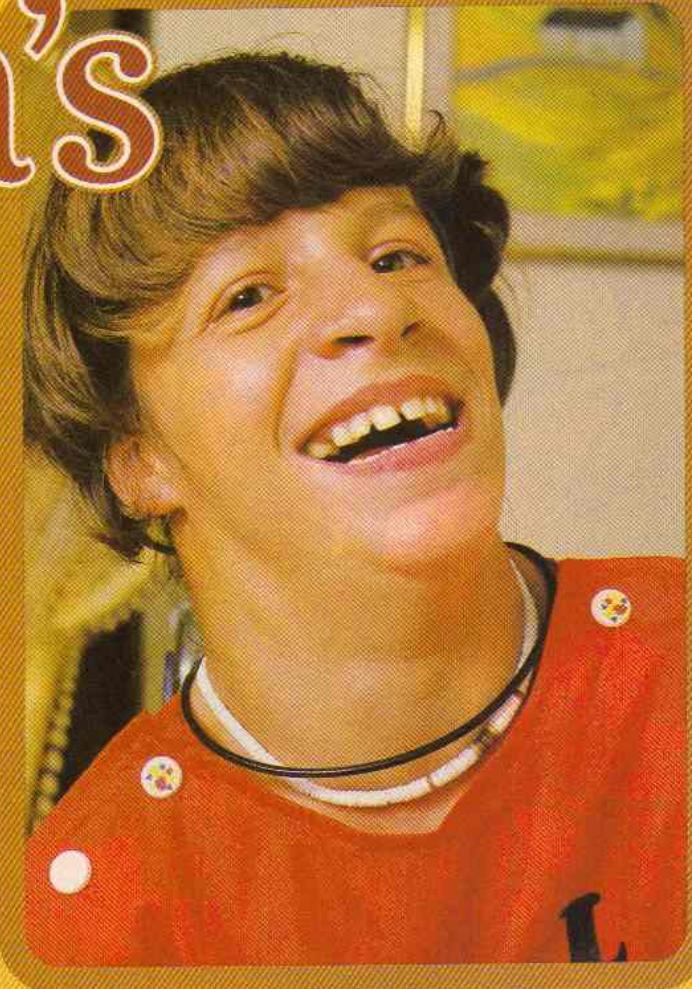




Laura's Story

A COMPUTER-AGE
VOICE MACHINE
CHANGES A
YOUNG GIRL'S LIFE

by R.A. Beckert



While her classmates shouted greetings, Laura Rivera sat silently. It wasn't that Laura, 14, from Miami, Florida, didn't want to join in. She simply couldn't. Laura can't walk or talk. She was born with cerebral palsy—a disorder of the nervous system. But today, Laura Rivera tells her family what she wants for supper, talks to friends and answers teachers' questions at school. True, her "voice" comes from a machine and sounds deep. But that doesn't matter one bit. This computer-synthesized voice is hers, and Laura is thrilled.

"It was pretty frustrating," admits Gloria Rivera, her mother. "We had to do a lot of guessing. It was like playing '20 Questions' to understand what she wanted."

"Now," Laura says "I can say 'I'm hungry' or 'I want a drink'."

"Now," says her mother, "we can find out what she's thinking."

Voice synthesis machines—computers that can talk—are making a world of difference for Laura. Before she got her machine, called an Express 3, she had a very hard time communicating with her parents, friends and teachers at Hialeah Junior High School.

Learning to Talk

Laura's Express 3 voice synthesis machine looks something like a giant Speak 'N Spell toy. The Express 3 is about the size of a briefcase. It has a control panel with letters, numbers and programmed commands. Laura makes the Express 3 talk by using foot pedals or a hand-held controller.

When Laura touches the foot pedals, a red light moves across the letters, numbers and commands. When the light is over the correct key, Laura presses the pedal again. This command stores the letter in the machine's computer memory. When a word is formed, she presses

another command and the Express 3 speaks.

The handheld controller, called a light sensor, works more quickly. Laura uses this controller to touch each letter, number or command she wants to store in the synthesizer's memory. She then touches the sensor to a command that makes the machine talk.

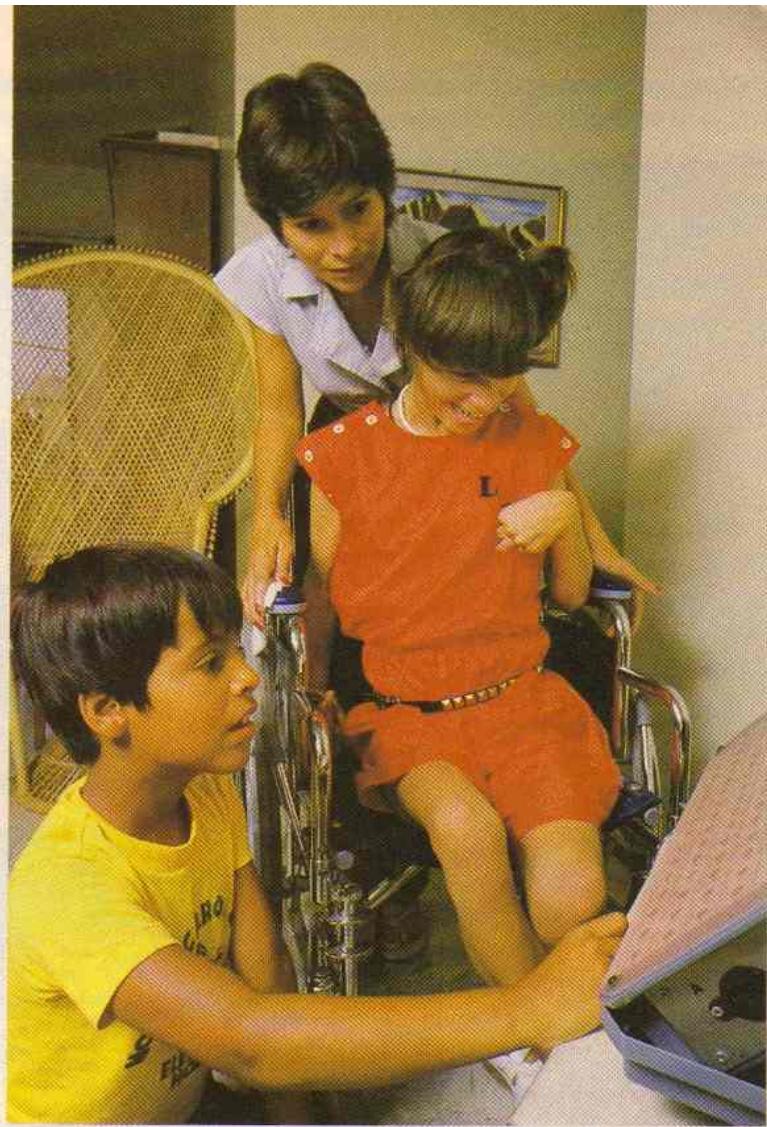
How They Work

For years, researchers have been trying to create machines that talk. Today's talking machines use two methods to create computer-synthesized voices.

One method has someone record words by speaking into a microphone. These words are then translated into a language a computer can understand. The machine stores these signals in its computer memory. It then uses these signals to recreate a recorded voice. A synthesized voice created this way sounds natural. But it uses up so much memory that the computer can store a very limited number of words.

Laura's Express 3 uses another method to make speech. No words are stored in the machine's memory, only parts of the words. These parts, called phonemes (FO-neems), are the smallest sounds in a language. For example, the "s" sound in the word "say" is a phoneme.

A voice created this way will sound less life-like than when a machine uses a recorded human voice. But the machine can speak an ➤

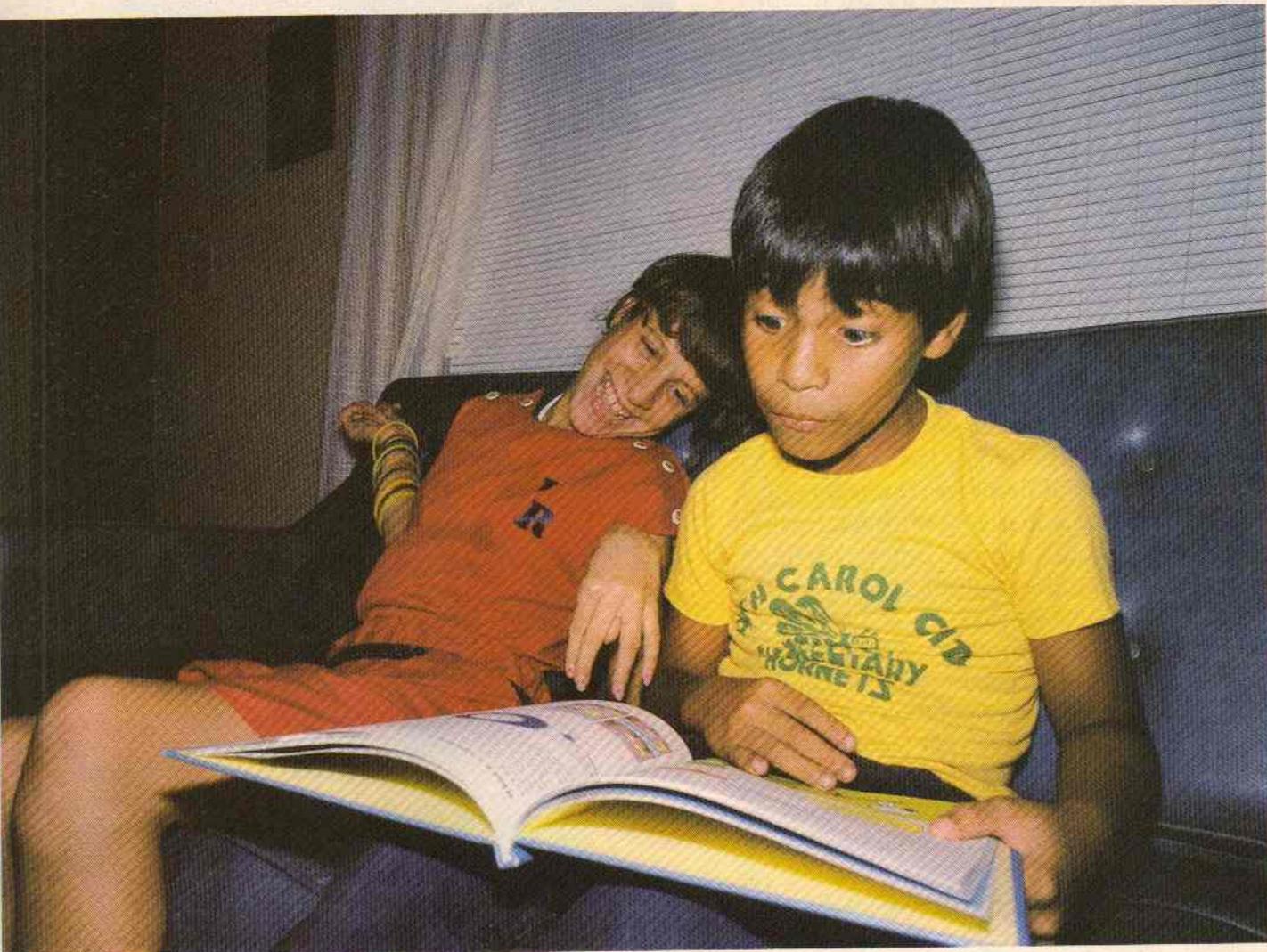


Above: Sharing a word. Laura could always communicate with her mother and her brother Marc. The voice synthesis machine lets Laura speak with the world.

PHOTOS © ROBERT HOLLAND



Left: Laura and Marc work side-by-side with the Express 3 machine. Happy, determined and excited, they both learn new words together.



unlimited number of words. And that means Laura can say anything she wants.

Misspelling The Right Way

A machine like Laura's that strings together phonemes has a problem—words don't always sound the way they are spelled. For instance, the word "wound" is pronounced one way in the sentence "He got a nasty wound." But it is pronounced another way in the sentence "She wound the clock." These words are spelled the same, but are pronounced differently and have different meanings. Computers can't tell the difference.

To get around this, Laura will have to learn how to misspell words. When she spells every word correctly, the machine may pronounce a common word in a strange way. Eventually, she will learn to spell words as they sound, so the Express 3 will pronounce words the right way.

She will also be able to store messages in the

A computerized voice synthesis machine can make a difference. But for Laura and Marc, reading together can be fun, too.

Express 3, according to Carol Vagnini, an official of the company that makes Laura's machine. The machine has a large memory, says Carol. "Some kids have programmed in the Pledge of Allegiance so they can say it with their classmates."

The Most Important Message

For the moment, Laura is still learning to make her machine talk. She already has a good idea of what communication is really all about. Right after she got the machine, she spent a long time getting her first message just right. Then she called her mother over and proudly ordered the machine to deliver the message she'd never been able to say before.

"I love you, Mommy."

ENTER

THE
HIGH-TECH
WORLD OF
COMPUTERS

Vanishing Video Games

What do you save when you own your own video game? The answer

to this riddle is hidden among the letters below.

Also hidden are the names of some famous and not-so-famous video games. They are written across, backwards, up, down and

even diagonally. Find the words in CAPITAL letters. Circle them. When you're done, the leftover letters will spell out the answer to the riddle. For the answer, check out the Did It! page.



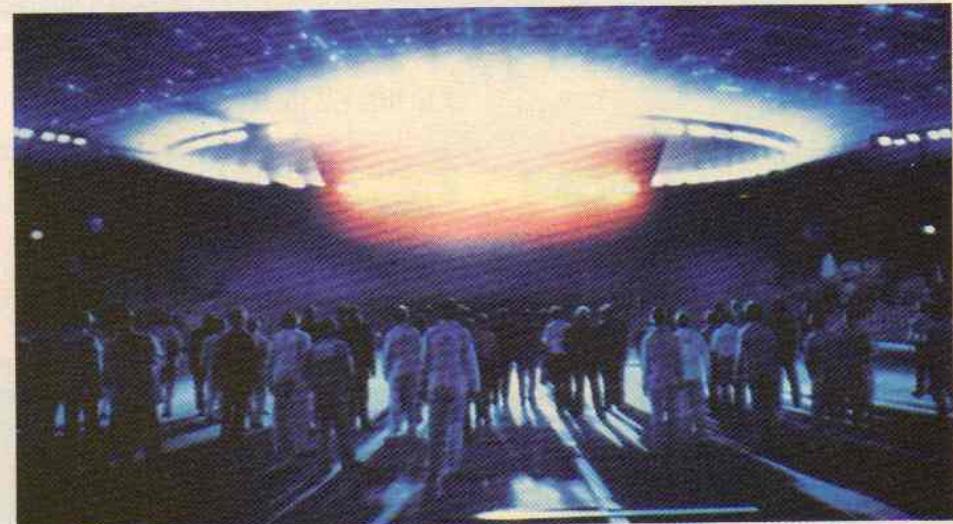
newsbeat

PCjr Bites The Dust

When IBM introduced the PCjr in 1984, a lot of people thought the machine would become the biggest seller in home computers. So it was a big surprise when IBM announced they stopped making the Jr last March. In spite of everyone's predictions, IBM never sold a lot of Jr's except when they dropped the price to under \$800 last December.

Owners of the Jr won't have as much trouble as owners of other disappearing computers like the Texas Instruments 99/4A. IBM says they will still produce new software and parts for the Jr. And, the Jr can run a lot of software made for the IBM PC, which is still being made. IBM will also continue to help PCjr owners through this toll-free number: 1-800-222 PCJR.

Does the death of the PCjr mean IBM is leaving the home computer market? Probably not. As we go to press, rumors are that IBM will soon have a new low-cost machine ready. In fact, it may be out in time for Christmas '85. In the meantime, you'll still find plenty of PCjr programs and software reviews in the ENTER section of 3-2-1 CONTACT.



PHOTO/EQUUS

So far, UFOs have only been sighted in movies, books and software!

Sci-Fi Software

Do UFOs amaze you? Then how about taking a trip to other planets—with your computer? Science fiction (sci-fi) software can send you out of this world into all sorts of strange places. Here's a round-up of some top sci-fi software:

- **Suspended**, a text adventure from Infocom, has you teaming up with robots to save an entire planet.
- **Planetfall**, another Infocom adventure, is a space age comedy. It's filled with laughs—and a mischief-making robot named Floyd.
- **Hitchhiker's Guide to the Galaxy** is Infocom's text adventure version of Douglas Adams's famous space race book. (Each of these Infocom games is available for most home computers.)
- **The Time Machine**, from Imagic, puts you into the famous science fiction story by H.G. Wells. Travel through the past and future in search of adventure. (For IBM PC and Apple II computers.)
- **Fahrenheit 451**, from Telarium, has you travelling through time

again. This time, you'll journey into a future created by sci-fi great Ray Bradbury.

● **Rendezvous with Rama**, also from Telarium, sends you into the future and into outer space. It's the year 2130 and you're aboard the giant spaceship Rama. (Telarium software is available for Commodore 64, IBM PC/PCjr, Apple II and Macintosh computers.)

New Home Computer Printer

Epson, Inc. is one of the biggest makers of printers for business and personal computers. Now they've introduced a printer designed to be used with most home computers. It's called the HomeWriter 10 and it can be connected to a Commodore 64, an Atari 800XL, an Apple IIc or the IBM PCjr.

The HomeWriter is a dot-matrix printer that can go as fast as 100 cps (characters per second). It has a list price of \$269, plus \$60 for the cartridge and cable you need to hook it up to your computer.

PHOTO COURTESY OF IBM



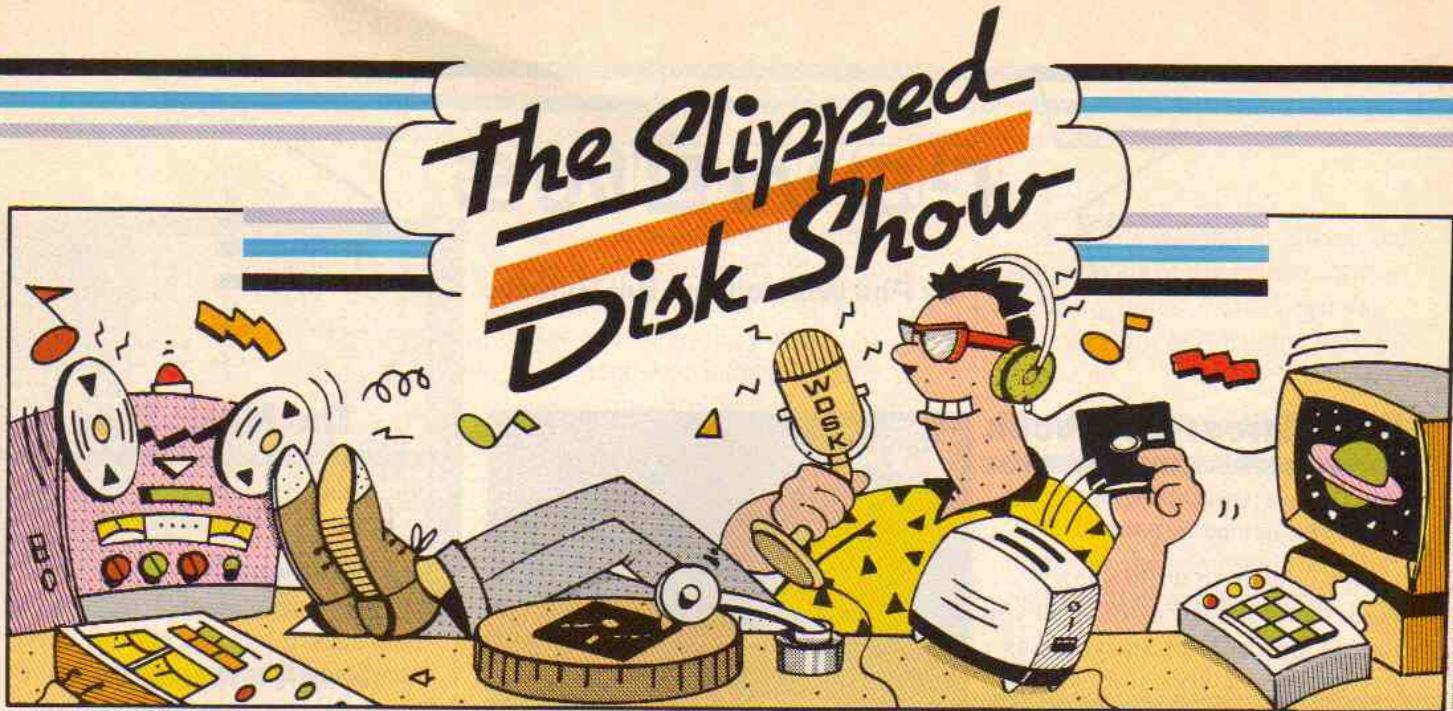


ILLUSTRATION BY CAMERON EAGLE

Hi there, kids, it's time for the Slipped Disk Show, the computer advice column that asks the musical question: "If Purple Rain falls on the Yellow Rose of Texas, can I still drive a Pink Cadillac?"

Speaking of Purple Rain, our first colorful question comes from **John Emerson** of Miami, Florida who asks:

"Can you make a hologram on a piece of paper? How can I make my own?"

John, it's like this. You can put a telegram on a piece of paper. You can put a mailgram on a piece of paper. You can even put a candygram on a piece of paper. But you just can't make a hologram out of paper.

What is a hologram? I'm glad you asked. Holograms are pictures made out of light. You can walk around a hologram, and it will look different from different angles. But when you reach out to touch it, there's nothing there.

To make a hologram you need a laser, mirrors, and special film. Most holograms are made by scientists and skilled artists.

Sometimes holograms are reproduced with layers of film. That kind of hologram looks three-dimensional even though it's on a

flat surface. Some credit card companies are putting this kind of hologram on their cards to prevent forgeries. Maybe that's why you thought they could be printed on paper.

So John, that's the story of holograms—get the picture? Next we have a question from **Cedric Jordan**, of Jamaica, New York. Cedric asks:

"Why does my computer say 'syntax error' if I spell a word wrong? Why doesn't it say 'misspelled word?'"

Cedric, I'd like to answer your question, but you made a syntax error. Next question!

No, seriously, when you make a syntax error it means you haven't typed in your program statements in the form—or syntax—your computer understands. A syntax error can be a mistake in spelling, in the order of the words, or even a missing comma.

You see, Cedric, computers only understand a limited number of words. For example, suppose you type "PRINY" instead of "PRINT." The computer will go over its list of words. If it doesn't find "PRINY," it will stop the program and display the message "syntax error." It isn't able to say to itself, "Oh, I guess the

user really means 'PRINT.'"

Home computers have a limited number of error messages. (The messages they flash on the screen when something goes wrong.) Usually all they can tell you is that something is wrong. They might even tell you what line the bug is on. But you have to find out if it's a misspelled word, a missing comma or something else.

Computers can be programmed to overlook some mistakes. For example, it is possible to program a computer to accept PRINY or PRINR instead of PRINT. But it will be a long time before a computer will be able to "understand" mistakes the way another human can.

Well, that's all the time we have this month. Meanwhile, this is Slipped Disk, the floppy disk jockey, reminding you to be kind to strange alien life forms—for a duck may be somebody's mother. And remember, if you have questions for your old buddy Slipped, just mail them to:

**The Slipped Disk Show
3-2-1 Contact Magazine
1 Lincoln Plaza
New York, NY 10023.**

Slipped Disk's dog appears courtesy of Woofware Records.

REVIEWS

by Phil Wiswell and Bill Gillette

Bank Street Storybook

Mindscape; Apple II computers, and Commodore 64; \$40

So you want to write a story! Well, here's the software to get you started. *Bank Street Storybook* is an easy way to write stories on your computer.

There's good news and bad news. The good news: You can animate each screen and you can create great graphics. The bad news: The animation isn't very good and each story is only 12 screens long. This software is easy to use. If you do get stuck, there's an excellent manual and an on-screen help menu.



Wrap-Up

Phil: Other programs like this, *Story Tree* and *Story Maker*, are good. But this is the easiest to use.
Bill: I wanted longer stories. A dozen screens isn't enough.

Doodle

City Software; Commodore 64

With *Doodle*, you draw on your computer screen, then print your

artwork on paper. The drawing commands are easy, even though some of them don't seem to make sense. For instance, why would you use a delete key to change screen color? That's the rule. If you remember which key does what, you'll get some beautiful art out of *Doodle*.

Wrap-Up

Phil: This is a powerful computer art program. It gives you a lot of shapes and colors to choose from.
Bill: But the manual isn't clear about how to use this program.

Brain Strainers

Coleco; ColecoVision and Adam; \$30

This is one of Coleco's worst efforts. It has just two kinds of challenges. In one, you have to recognize shape patterns. In another, you try to recognize color patterns. It's a bit like the old hand-held electronic game Simon.

Wrap-Up

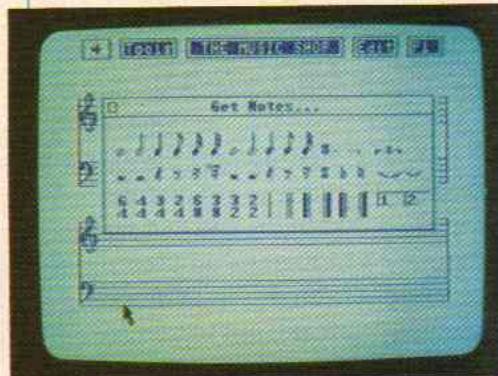
Bill: There are plenty of puzzles, but they all use the same shapes.
Phil: And the graphics and sound effects are not that good. You deserve more from software.

The Music Shop

Broderbund; Commodore 64, the IBM PCjr; \$45

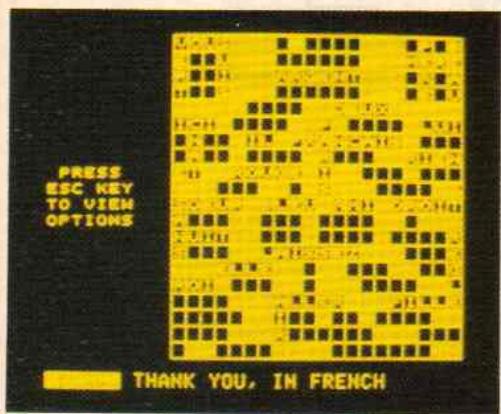
In some ways *The Music Shop* is a lot like other musical software packages. It lets you change keys, change tempo and print out your music. But in one important way, this software is an improvement over other programs. *The Music Shop* turns your computer into a synthesizer.

This means you can really control the sound coming out of your computer. You can turn your computer into a trumpet, a piano or some other musical instrument. And the software's easy-to-use commands makes this as simple as whistling in the dark. *The Music Shop* program does run slower than some other music software. But if you're willing to wait, you'll be able to create some very good sounds.



Wrap-Up

Bill: The synthesizer is the best I have heard on a home computer. Still, I wish the program ran faster.
Phil: I think that it's worth the extra time to get this high quality sound out of your computer.



Crossword Magic

Mindscape; Apple II, \$50; also for Commodore 64 and IBM PC

Crossword Magic helps you create original crossword puzzles using words of your choice. Then it lets you solve these puzzles either on screen or on paper.

To create a crossword puzzle, you type words into the computer. One by one, the computer places the word within a puzzle form. Once this grid of words is complete, you type in clues. You have to like creating crossword puzzles and coming up with clues. If you do, this program will really help. If not, the magic won't really matter.

Wrap-Up

Bill: I like Crossword Magic. It's a great help for creating your own custom-made crossword puzzles. **Phil:** I like it, too. I only wish that you could enter a word and its clue at the same time.

Wordfinder

CBS; IBM PC/PCjr, \$35; also for Apple II and Commodore 64 computers

How many words of three or more letters can you make from the word CHILDREN?

RED. NERD. That's good. But how about HIDE and RIDE and nearly 100 other words? If you

think you're good at this game, you might want to try Wordfinder. It's a computer game that tests your word-making powers. As you enter each word, the computer checks the entry against its built-in dictionary. The longer the word, the more points you score.

Wordfinder doesn't have great graphics. But it does let you play alone, against a friend, or even against the clock. It's too bad that there are only 24 words from which to make new ones.

Wrap-Up

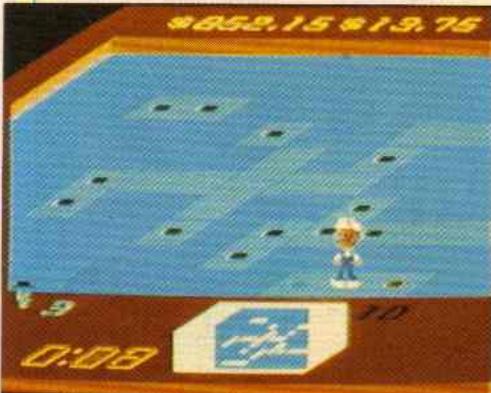
Phil: I enjoyed this game. But why would you spend \$30 or more for a game that can be played on paper? **Bill:** This game will make you learn new words. But you really don't need a computer to play.

Rock 'N Bolt

Activision; Commodore 64; \$30

Rock 'N Bolt is simple to learn, simple to play, and simply one of the most exciting games from Activision in a long time.

Players build a tower by bolting metal beams together. Every level is tougher than the last, and every level of the tower is different. On each level, some beams stand still while others move back and forth or up and down. You've got to be quick to keep your balance to keep up with the action.



As if this weren't tough enough, some levels of the game include building plans. Build the level exactly right or the game won't continue.

Wrap-Up

Bill: This is a great game with super musical effects.

Phil: The music plays faster and higher as the game goes on. That really added to the action.



Movie Musical Madness

CBS; Atari, \$30; also for the Commodore 64

Do you want to be in pictures? Movie Musical Madness lets you use graphics and sound to create movies on your computer.

First, use your joystick to put a picture of a piano, an elephant or some other image on the screen. Then select a melody. Finally, choose one of three characters to act in the scene. With the joystick, you decide where this character will go and what it will do. For example, your actor can sit down and play the piano or ride on the back of the elephant. When everything is set up, just sit back and yell "Action!"

Wrap-Up

Phil: I had fun with this software. **Bill:** I wish the sound was better.

bASIC TRAINING

PROGRAMS FOR YOUR COMPUTER

Happy Birthminute to You!

**Apple, Adam, Atari, Commodore,
IBM, TI 99/4A, Timex, TRS-80, VIC-20**

How old are you? That's an easy question when you say how old you are in years. But what about in days? In minutes? If you don't know how many minutes you've been on Earth, this program will tell you.

There are advantages to being up to the minute with your age. For instance, you can figure out exactly how long you have to wait until your next birthday. And you can start making up your own holidays — like your 500,000th birthminute. (You can try celebrating birthminutes, but don't count on getting too

many presents.)

In lines 70 through 160, the program will ask for the year, month and day you were born. Then it will ask for current information, including the time. Lines 180 through 210 determine if you've already had your birthday. Then in lines 230 to 310, the program figures out how many days since your last birthday. It does this using the numbers in array M, which are loaded in lines 30 and 40.

The number of days and minutes since you were born are figured out in lines 320 and 420. If you're a real fanatic, the program can be made even more exact. For instance, it doesn't ask for the hour and minute you were born. It also doesn't really count leap years. Instead, it counts every year as 365.25 days. And,

you can easily add a few lines to figure out your age in seconds.

This program was adapted from one sent in by **Stanley Lau**, of Glendale, California who is approximately 4,383 days or 3,155,760 minutes old. The program is written for Apple and Adam computers. To adapt it for other machines, follow the instructions below.

Commodore 64 and 16, VIC

20 Change HOME in line 60 and 130 to PRINT CHR\$(147)

IBM and TRS-80 Change HOME in line 60 and 130 to CLS

Atari Change HOME in line 60 and 130 to PRINT CHR\$(125)

TI 99/4A Change HOME in line 60 and 130 to CALL CLEAR. If you don't have Extended BASIC, break up all multiple statement lines. Change all IF statements to TI syntax.

Timex-Sinclair 1000, 1500, 2068 Change HOME in line 60 and 130 to CLS Break up all multiple statement lines. Break up the DIM statement in line 20 into single DIM statements. Lines 10, 20, 180, 220, 240, 260, 270, 300, 310, 320, 360, 410, and 420 should begin with the word LET. Change all IF statements to Timex-Sinclair syntax.

```

10 REM AGE FINDER
20 R = 0: DIM M(12), Y$(1), M$(2)
30 FOR K = 1 TO 12
40 READ M(K): NEXT K
50 DATA 31,28,31,30,31,30,31,31,
     30,31,30,31
60 HOME
70 PRINT "WHAT YEAR WERE
     YOU BORN IN: ";
80 INPUT BY
90 PRINT "WHAT MONTH (IN
     NUMBER FORM): ";

```

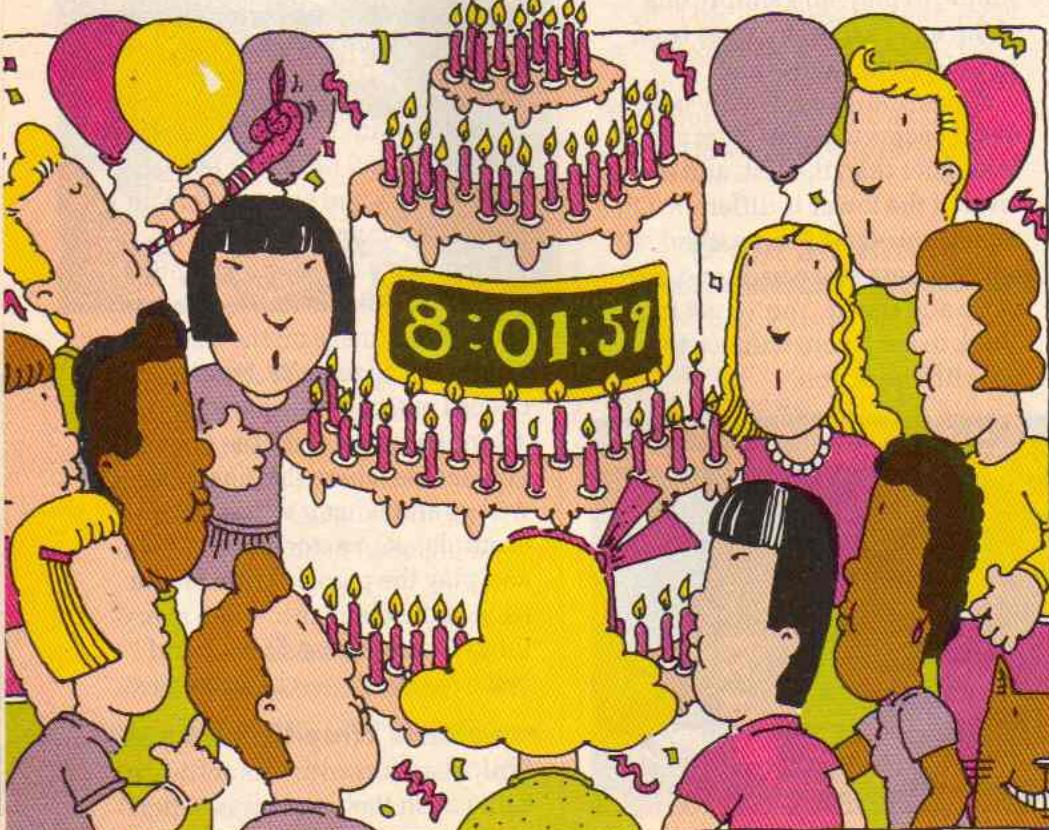


ILLUSTRATION BY KIMBLE MEAD

```

100 INPUT BM
110 PRINT "WHAT DAY: ";
120 INPUT BD
130 HOME
140 PRINT "INPUT CURRENT
MONTH, DAY AND YEAR"
150 PRINT "IN NUMBER FORM,
LIKE THIS: MO,DA,YR"
160 INPUT CM,CD,CY
170 IF BY > 100 THEN BY =
BY - 1900
180 AY = CY - BY
190 IF CM > BM THEN 290
200 IF CM < BM THEN 220
210 IF CD > = BD THEN 310
220 AY = AY - 1
230 FOR K = BM + 1 TO 12
240 R = R + M(K): NEXT K
250 FOR K = 1 TO CM - 1
260 R = R + M(K): NEXT K
270 AD = R + M(BM) - BD + CD
280 GOTO 320
290 FOR K = BM TO CM - 1
300 R = R + M(K): NEXT K
310 AD = R + CD - BD
320 A = INT (AY * 365.25) + AD
330 PRINT
340 PRINT "INPUT CURRENT
TIME (HR,MIN)"
350 INPUT CH,CI
360 H1 = CH
370 PRINT "IS IT AM OR PM?"
380 INPUT HS
390 IF HS = "AM" THEN 420
400 IF HS < > "PM" THEN 370
410 H1 = CH + 12
420 B = CI + (H1 * 60) +
(A * 720) - 720
430 PRINT : PRINT
440 PRINT "YOU ARE ";AY;"YEARS AND"
450 PRINT AD;" DAYS OLD"
460 PRINT
470 PRINT "OR, YOU ARE ";A;"DAYS OLD"
480 PRINT
490 PRINT "OR, YOU ARE ";B;"MINUTES OLD"
500 PRINT "AS OF ";CH;";";CI,HS
510 PRINT
520 PRINT "ARE YOU DONE?
Y/N"
530 INPUT AS
540 IF AS = "Y" THEN 560
550 GOTO 20
560 END

```



Abstraction Distraction

Apple

Here's some modern art you won't find in any museum. And you don't have to be a starving artist to create this masterpiece. Your computer does all the work!

To make geometric designs appear, just enter two numbers between 1 and 15. The first number sets the distance between the shapes. The second number sets the center of the design.

Can you figure out other ways to change the design? Try your own hand at computer art. Can you change the design by changing lines 150 and 160? What happens

when you change line 90? Or line 190?

This programming masterpiece was written by **Sanford Swain**, 13, of Astoria, Oregon.

```

10 REM ABSTRACTION
20 TEXT : HOME
30 PRINT "PICK A NUMBER
BETWEEN 1 AND 15"
40 INPUT "TO EXIT, ENTER
99";A
50 IF A = 99 THEN 210
60 INPUT "ENTER ANOTHER
NUMBER BETWEEN 1 AND
15";B
70 HGR
80 C = C + 1
90 IF C > 7 THEN C = 0
100 HCOLOR = C
110 Y = 159
120 FOR X = 1 TO 120 STEP A
130 Y = Y - B
140 IF Y < 1 THEN Y = 1
150 HPLOT X,X TO Y,X
160 HPLOT X,X TO X,Y TO Y,Y
TO Y,X
170 NEXT X
180 Z = Z + 1
190 IF Z = 8 THEN 20
200 GOTO 80
210 END

```

Corrections

In the March issue of Enter, the TRS-80 Racer program had a mistake in line 100. It should have read:

```

100 IF R = 1 AND T > 1 THEN
T = T + 1 ELSE IF R = 2 AND
T + W < 31 THEN T = T + 1

```

In the April issue, line 1410 of the Cursor program should read:

```

1410 IF K = 0 THEN 1430

```

To adapt the Cursor program for the Commodore 64 and VIC 20 you must change variable TI in lines 20, 70 and 80 to MI.

SPACE DETECTIVE

by Richard Chevat

The famous computer scientist Binary Beetle has been kidnapped. The slimy space villain wants Binary B. to give him the plans to LOMGSADS. That's short for Laser-Operated Missile Guidance System and Dating Service.

With LOMGSADS in his greedy little hands, the alien will be able to destroy the galaxy's defenses. And he will also be able to ruin everybody's Saturday night on 37,146 planets.

As Space Detective Third Class, your job is to find Binary's kidnapper.

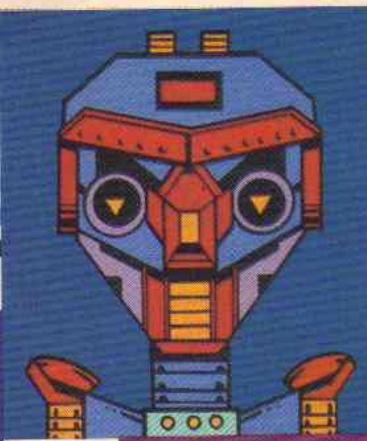
The Suspects: Space creatures Picdar, Nova-Targ and Skreel were all seen within a parsec of the scene of the crime.

The Clues: Binary managed to leave a clue for the Galactic Police. The clue is the piece of graph paper you see on this page. Next to each row on the graph are some numbers. The numbers are a code that tell you how to fill in the boxes. The first two rows of numbers are already decoded. Using the numbers, the graph paper, and the pictures of the three aliens, can you figure out who the kidnapper is?

Answer on Did It! page.



Nova-Targ



Skreel

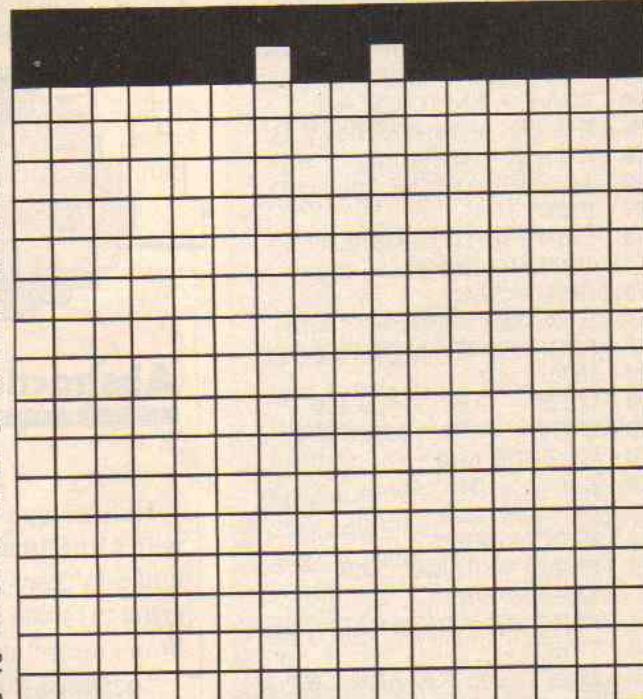


Picdar

ILLUSTRATIONS © BRAD HAMANN

The Numbers:

16
6,1,2,1,6
5,6,5
3,10,3
2,5,2,5,2
2,12,2
2,1,4,2,4,1,2
2,1,4,2,4,1,2
2,2,1,1,1,2,1,1,1,2,2
2,2,1,1,1,2,1,1,1,2,2
3,4,2,4,3
4,2,4,2,4
5,2,2,2,5
5,2,2,2,5
1,2,10,2,1
1,3,2,4,2,3,1
2,12,2
2,1,2,6,2,1,2



Send Us Your Programs

Have you written a program you think should be in BASIC Training? If you have, then send it to us at:

BASIC TRAINING

3-2-1 CONTACT

1 Lincoln Plaza

New York, NY 10023.

If we like it, we'll print it, and send you \$25 and an ENTER T-shirt. All programs must be your original work.

Remember to include a note with your program that tells us your name, age, and T-shirt size. Don't forget to tell us the brand of computer you used and to include a short description of what the program does.

WELCOME TO PLANET EARTH

Mambo's Advice to Aliens (as told to Jim Lewis)

Gneep Zloreep! It's time once again to explain Earth to space visitors. This month's question comes from Rebop Riff of planet Arwah. It was sent in by Katherine Marmar of Cumberland Grove, Maine. Rebop wants to know:

What's a School? Well, Rebop, school is where Earthlings go to learn. But as any Earth kid will tell you, there is a lot more to school than that. Here is Mambo's guide to the first day of school.

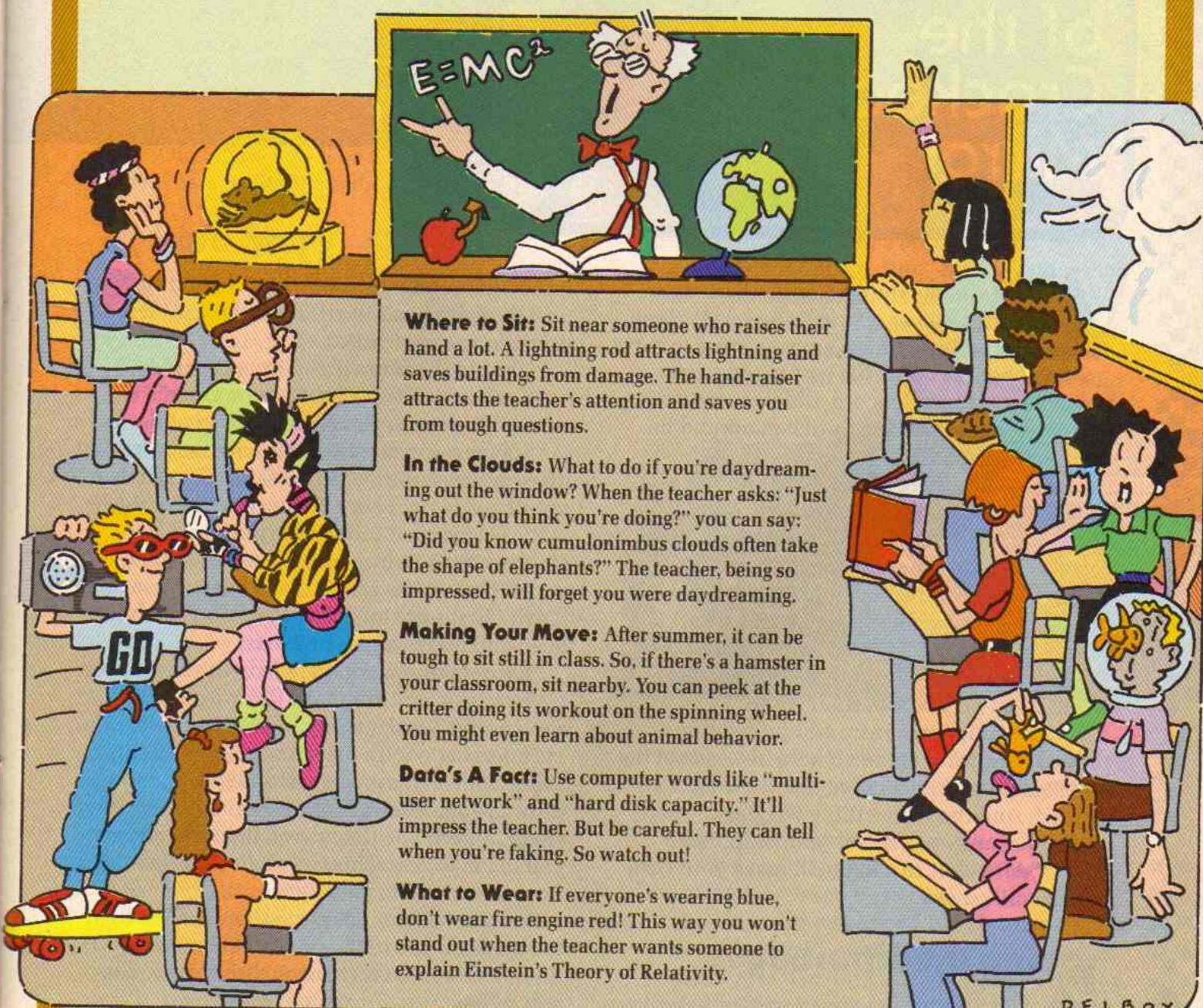


ILLUSTRATION BY BOB DELBOY

Where to Sit: Sit near someone who raises their hand a lot. A lightning rod attracts lightning and saves buildings from damage. The hand-raiser attracts the teacher's attention and saves you from tough questions.

In the Clouds: What to do if you're daydreaming out the window? When the teacher asks: "Just what do you think you're doing?" you can say: "Did you know cumulonimbus clouds often take the shape of elephants?" The teacher, being so impressed, will forget you were daydreaming.

Making Your Move: After summer, it can be tough to sit still in class. So, if there's a hamster in your classroom, sit nearby. You can peek at the critter doing its workout on the spinning wheel. You might even learn about animal behavior.

Data's A Fact: Use computer words like "multi-user network" and "hard disk capacity." It'll impress the teacher. But be careful. They can tell when you're faking. So watch out!

What to Wear: If everyone's wearing blue, don't wear fire engine red! This way you won't stand out when the teacher wants someone to explain Einstein's Theory of Relativity.

ASK MAMBO

Do you have any questions for Mambo? Write to:

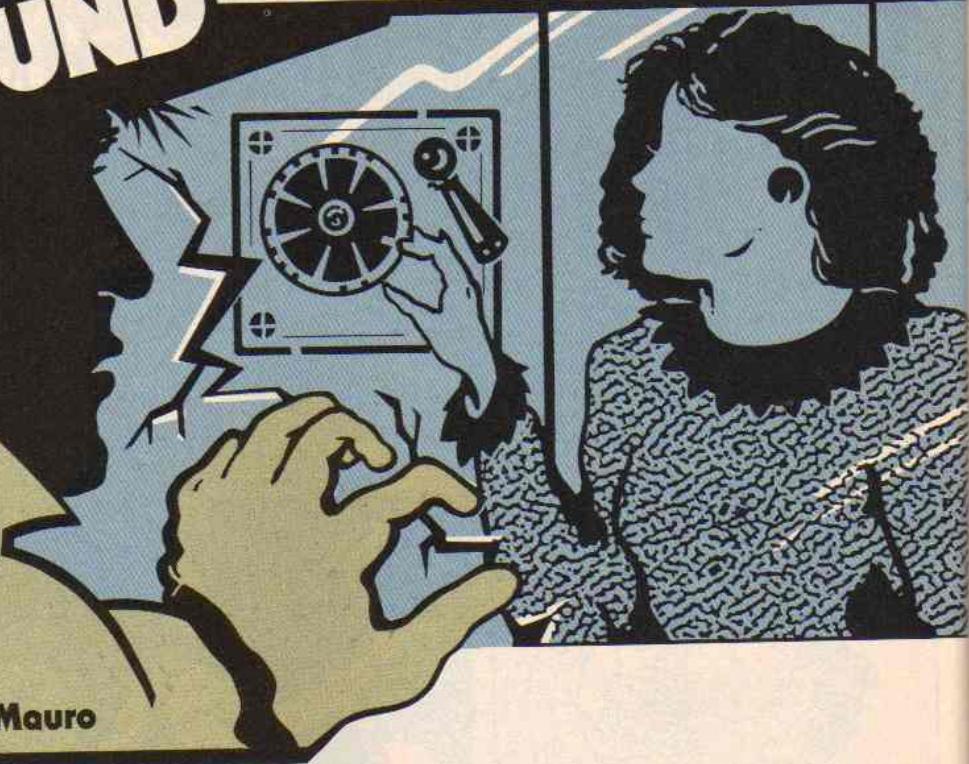
Mambo! 3-2-1 CONTACT, One Lincoln Plaza,
New York, NY 10023.

THE BLOODHOUND GANG

The Case of the Cracked Mirror

by Lisa de Mauro

ILLUSTRATIONS BY ROBIN MOORE



Vikki was laughing so hard, there were tears in her eyes. "Skip," she cried, "how many of those things are you going to eat?"

Skip, who was doing his best to set a new banana-eating speed record, didn't even try to answer. He was on his third banana and he still hadn't broken 10 seconds.

Ricardo just shook his head. "Skip," he said, "what you need is an afternoon off. And I have just the ticket. Three tickets, to be exact. Here."

He held out three yellow and orange cards. Vikki took one and read aloud: "Admit one person, free of charge. Grove Amusement Park."

"My friend Hector works there," Ricardo said. "He's allowed to give out three free passes a week. What do you say, shall we go?"

He took Skip by the arm and pulled him toward the door. "There's a wild new ride at the amusement park. It's called the Jitterbug. It spins around. And the whole thing wiggles."

"That sounds perfect for you, Skip," said Vikki. "After that snack, you'll make your own banana milkshake."

Doing the Jitterbug

DThe Jitterbug was even wilder than Ricardo had described. After one ride, Vikki wobbled down the ramp. "Someone filled my

legs with Jell-O," she said. "But it was fun."

"I thought it was terrific," said Skip. "It really gave me an appetite."

"Ohhhh," came a groan from Ricardo.

"Ricardo," Vikki cried, "you're green!"

"But no greener than usual," Skip said.

"Maybe our next choice should be something more down-to-earth," Vikki said. "The House of Mirrors is right here. It doesn't spin or jiggle."

Ricardo started toward the building. He stopped short in front of a big mirror near the door. "Oh no!" he said. "I look even worse than I feel!" In the mirror, Ricardo had a squashed head and feet as big as tugboats.

"It's not you," Vikki laughed. "It's the mirror."

"How can a mirror make Ricardo look like such a goon?" asked Skip. "No offense Ricardo."

"It has to do with the surface of the mirror," Vikki said. "All mirrors reflect light. But the mirrors you usually look at are flat. When you stand in front of a flat mirror, light travels from you to the mirror. Then it is reflected right back from the mirror to your eyes."

"But this mirror has curves in it. When light travels from you to the mirror, it hits the curves. Then it bounces off in many directions. What you see is a very funny-looking image."

Just then, a teenager ran out of the building. He stopped running when he saw the Gang.

"Hey," Ricardo cried, "it's Hector. What's the matter, Hector? You look upset."

"Mrs. Washington was robbed," Hector said. "She owns the House of Mirrors. We just called the police from her office. But as long as you're here, will you look into the case?"

"Sure," the Gang replied. They followed Hector through a maze of mirrors. Their reflections were everywhere. Vikkis, Skips, Ricardos and Hectors stared back at them from the walls, the floor and the ceiling.

Finally, they reached Mrs. Washington's office. It had no windows. The walls were glass. They were all huge mirrors.

"Mrs. Washington, this is the Bloodhound Gang," Hector said.

Mrs. Washington smiled, but she looked worried. "Oh, I hope you'll be able to solve this."

"Tell us what happened," said Vikki.

A Safe Story

"Someone got into my safe again," Mrs. Washington began. "I had nearly three hundred dollars in there and somebody took it."

"Where is the safe?" Ricardo asked.

"It's here," Mrs. Washington said. She pointed behind her desk. Set into the wall-sized mirror was a small safe. The door was open and the safe was empty. The Gang moved behind the desk for a closer look.

"The lock wasn't broken," Skip said.

"No," said Mrs. Washington, "That's what surprised me. The thief must have used the combination to open the safe. But I thought I was the only one who knew the combination."

"And you say this has happened before?" Vikki asked.

"Yes," Mrs. Washington replied. "This is the third time since April that someone has taken money from the safe. I put in a new lock with a new combination after each robbery. But someone always finds a way to open the safe easily. Nothing has ever been broken. Except..."

"Except?" Ricardo asked.

"Oh, I'm sure it has nothing to do with the robberies. It's just that last spring, one of my office walls broke. I don't know how it happened. I came in one morning and there was a big crack in the mirror. That one," Mrs. Washington said. She pointed to the wall across from the

desk. "I had to have that huge mirror replaced."

"Try to remember," Vikki said. "Did that happen before or after the first robbery?"

"Let's see," said Mrs. Washington. "The first robbery was April third. I think the mirror broke before that. Yes, it was the last day of March."

"Who replaced the broken mirror?" Vikki asked.

"It's funny you should ask that," said Mrs. Washington. "It was a young man named Jim Phipps. He asked if he could have a job here so I hired him. He keeps the mirrors polished and replaces the cracked ones. He does a good job, too. So that broken mirror did bring me luck."

"Does Jim know about the latest robbery?" asked Vikki.

"No," said Mrs. Washington. "I haven't seen him today. It's his day off....Oh look, this is a surprise. He's here after all."

A young man stood at the door to the office. He carried a cloth and a bottle of glass cleaner.

"It happened again, Jim," Mrs. Washington said. "Someone got into the safe again. The Bloodhound Gang is here to help find the thief."

"Another robbery? That's awful," Jim said. He shook hands with the Gang. "I wondered who



Hector and Mrs. Washington were telephoning. It must have been you. You certainly got here fast."

"Mrs. Washington didn't call us," Ricardo said. "We just happened to be visiting the park today. Hector asked us to help."

"But how did you know that Hector and Mrs. Washington made a telephone call?" asked Skip.

"I saw Mrs. Washington using the telephone," Jim said. "I arrived at the House of Mirrors 15 minutes ago. I came to the office, but Mrs. Washington and Hector seemed busy. So I left." ➤

"I didn't see you here," Mrs. Washington said. "No," said Jim. "I didn't walk all the way into the office. And from where I was standing, you couldn't see me. But I could see you...in the wall mirror. Now if you don't need me, I have some mirrors to polish."

Jim closed the door behind him. Vikki whispered, "Jim should try polishing up his story."

Washington's desk. "The one that was broken?" Vikki nodded her head.

Mrs. Washington was amazed. "But how did you know?"

"In a way," Vikki replied, "Jim told me. He knew that Hector had been here. He knew that you had used the telephone, Mrs. Washington. But how did he know?"

"He said he saw us in the mirror," Mrs. Washington replied.

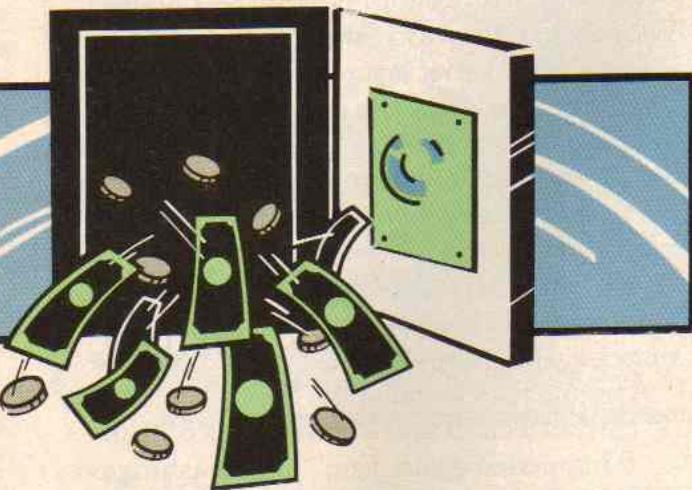
"But you couldn't see him!" said Vikki. "That's how I knew that Jim wasn't looking at an ordinary flat mirror when he saw you on the phone. With a flat mirror, if Jim could see your reflection, then you would be able to see Jim's reflection. Light would bounce off the mirror in the same way whether it was going from Jim to you or you to Jim."

"So Jim must have used a two-way mirror to see into Mrs. Washington's office," Ricardo said.

"Right," said Vikki. "When the mirror wall broke, Jim put in a two-way mirror." Vikki went out into the hall for a moment. Then she returned. "Sure enough," she said. "There's a supply closet behind this wall mirror. From there, Jim could get a clear view of the office. When Mrs. Washington opened the safe, Jim could see the numbers of the combination. Then, when he knew the office was empty, he could open the safe and take the money."

"My goodness," said Mrs. Washington. "A two-way mirror. What an idea!"

"It certainly was a clever plan," Vikki said. "But I guess you could say we saw through it."



"Do you think he was lying?" Skip asked.

"Not exactly lying," Vikki said. "But I don't think he was telling the whole truth."

"Let's get him back in here," Ricardo said.

The Gang Cracks the Case

"I think this will do it," said Vikki. She reached for the light switch. Suddenly, the room was completely dark. A few seconds later, Jim burst into the room.

"What happened to the lights? What's going on?" he asked.

"How did you know the lights were off?" Vikki said.

"I couldn't see, I..."

"You couldn't see us in the mirror? That's the trouble with mirrors," Vikki said. "You need light in order to see anything in them. Even when they're two-way mirrors."

"Two-way mirrors?" Mrs. Washington said.

"Sure," said Vikki. "It's like an ordinary mirror. But the silver coating on the back is very thin. A person sitting behind the mirror can see through it into the room. The people in front of the mirror can only see themselves."

"You mean that's a two-way mirror?" Skip asked. He pointed at the wall across from Mrs.

Watch for next month's
Bloodhound Gang
mystery!



Experiment

Seeing Sound

Sound travels in invisible waves. Here's how to make a gadget that can help you "see" these waves.

What You Need

a clean, empty soup can
a balloon
a rubber band
6 grains of uncooked rice

a can opener
a radio
scissors

What You Do

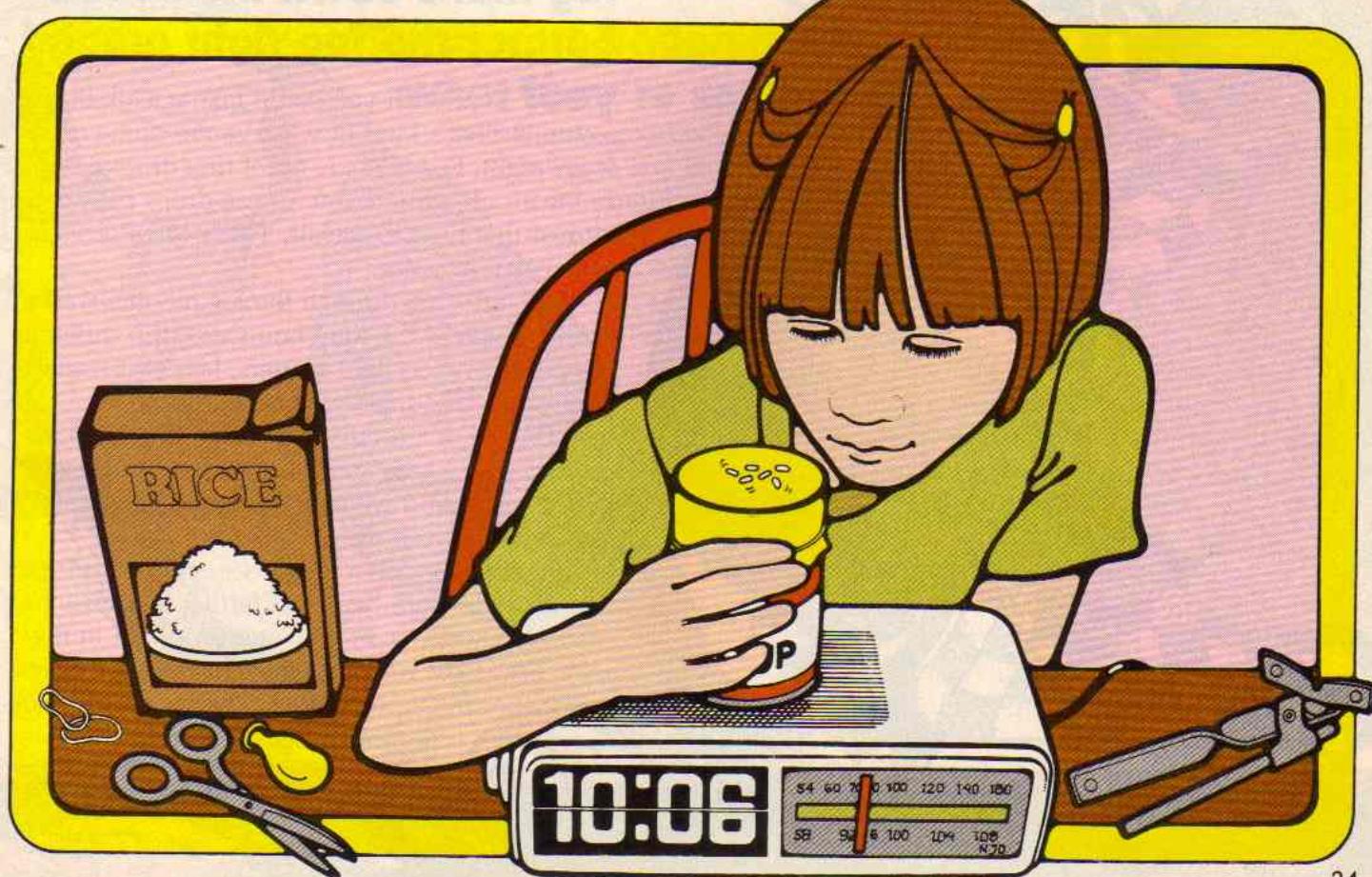
1. Ask an adult to remove the top and bottom lids of the can. Make sure there are no sharp edges left.
2. Stretch the balloon over one end of the can. If you cut off the end of the balloon first, it fits over the can more easily.
3. Put the rubber band over the end of the can to hold the balloon in place.
4. Place the rice on the balloon's surface. Now you're all set.

5. Hold the can over a radio speaker. Turn up the volume of the radio. Watch what happens to the rice.
6. Experiment with other sounds to see what happens. For example, have your friend shout or clap her hands below the can.

Why It Works

Sound waves are really vibrations that travel through the air. The vibrations from your radio speakers made the particles of air around the speakers vibrate, too. These particles moved forward and bumped into other air particles. Those bumped into still more, and so on. This is how a sound wave moves through the air.

When the sound wave from your radio speaker reached the balloon's surface, the moving air particles bumped into it. The balloon's surface began to vibrate and that made the rice move.



Any Questions?

by Joanna Martin

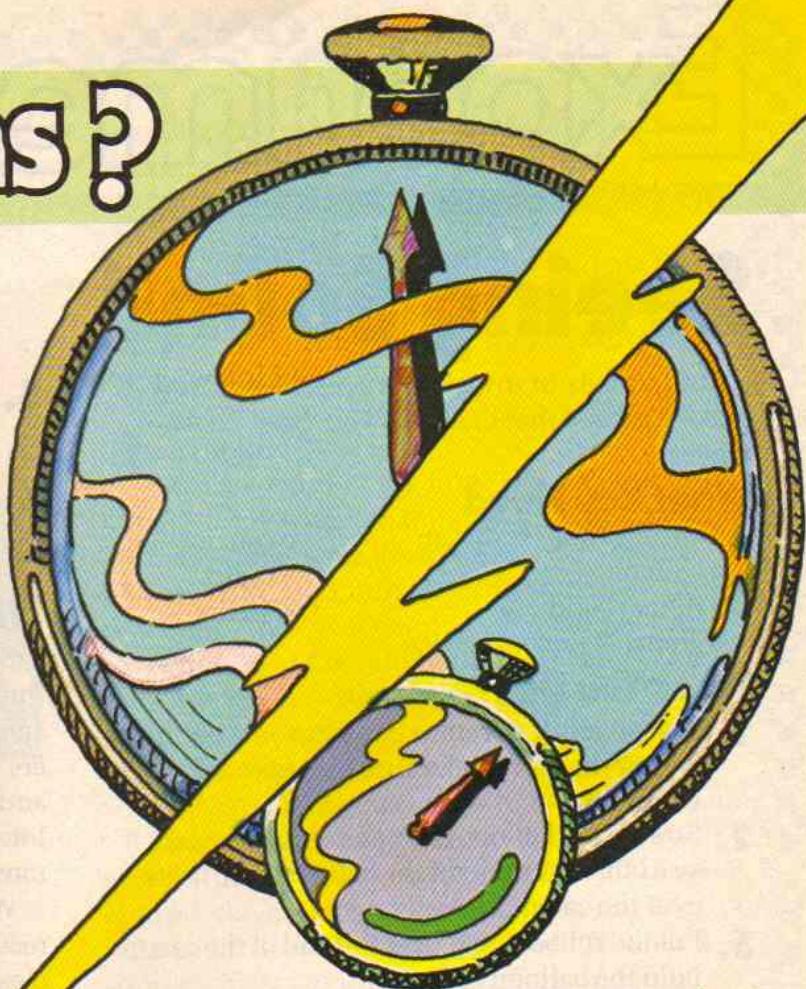
How fast does light travel?

During a storm, the flash of lightning and the crash of thunder travel through the air. They start at the same time, but the lightning always reaches you first. That's because light waves travel much faster than sound waves.

Light actually travels at the amazing speed of 186,242 miles per second. If you were on a rocketship moving that fast, you could go around the earth more than seven times in one second!

Knowing the speed of light gives scientists an easy way to measure the vast distances of space. They call the distance that light travels in one year—what else?—a light year. That's shorthand for 5.88 million million miles. Take Proxima Centauri, the star nearest our sun, for example. It's quicker to say it is 4.3 light years away than it is 2,518,400,000,000 miles away!

Question sent in by Mark Kroflich, Merritt Island, FL.



How come you can see the fog that's down the street, but not the fog right around you?

you? Ever wish you could take a walk through a cloud? That's kind of what you're doing on a foggy night. Fog is made up of tiny drops of water in the air all around you. These drops collect bits of dust that float in the air. That's what gives fog its misty gray color.

Light traveling through the fog hits the water drops. Much of the light bounces off in different directions. When light scatters, less of it reaches your eyes. That makes things harder to see.

In the fog, it's pretty easy to see things right around you. There aren't too many water drops between you and what you're looking at. Plenty of light reaches your eyes.

Now, the fog down the street isn't any thicker. But the light from there has farther to go before it reaches your eyes. More water drops get in the way. Less light gets through. This makes objects down the street look darker. The fog seems thicker.

Question sent in by Steve Cunial, Livermore, CA.

Do you have a question that no one seems able to answer? Why not ask us? Send your question, along with your name, address, and age, to:

Any Questions?
3-2-1 CONTACT
P.O. Box 599
Ridgefield, NJ 07657

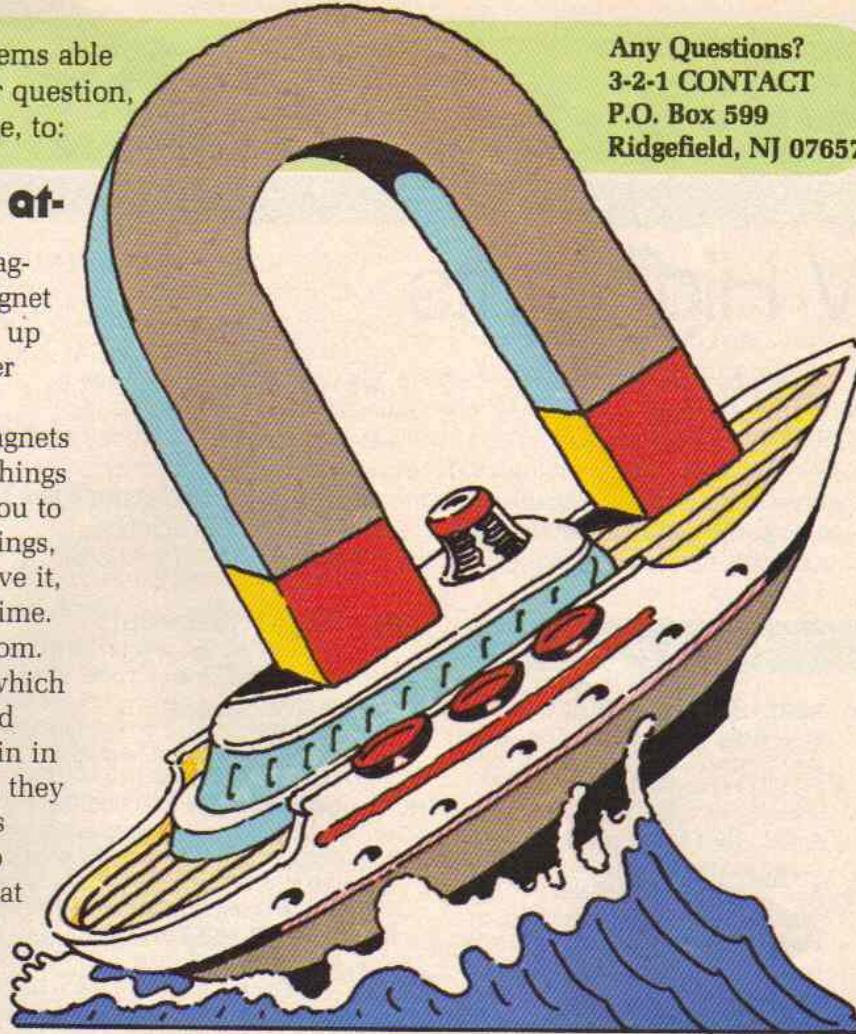
Why do magnets only attract metal?

Wait a minute! Magnets don't attract all metals. Grab a magnet and start playing with it. You can pick up iron nails. But you can't pick up copper pennies or aluminum soda cans.

Whether a material is attracted to magnets depends on how it's put together. All things are made of tiny atoms, too small for you to see. These are made of even smaller things, including electrons. You may not believe it, but these electrons are moving all the time. They spin around the center of each atom.

In most things, electrons spin every which way. But in certain metals, like iron and nickel, the electrons can be made to spin in the same direction. When this happens, they build up a magnetic field. These metals are the only ones that can be made into magnets. And they are the only ones that can be attracted by magnets, too.

Question sent in by Lynn Lu, Lincoln, NE



ILLUSTRATIONS © GEORGE MASI

Do parrots understand what they're saying?

Most parrots make good pets. You can teach them to talk—in any language. Many will learn to say simple phrases. Some have learned as many as 100 words.

Champion talkers are the African gray parrot and the Amazon parrot of South America.

Parakeet and budgie birds are also able to speak. But these small members of the parrot family aren't as chatty as their big cousins.

Parrots learn by imitating. They hear the sounds you say over and over. Like a tape recorder, they play back what you say. They don't really understand the words, though they often learn when to say things. For example, when a parrot says, "Polly wants a cracker," it does not know its name is Polly. But it may understand that saying this will get it something to eat!

Question sent in by Ned Williamson, Santa Ana, CA.



3·2·1·CONTACT

TV Highlights

Get out the popcorn and warm up the tube! On September 30 another season of "3-2-1 Contact" gets under way. Your old friends Miguel, Paco, Robin and Kathy will be back in 20 brand new shows. In addition, three new members of the cast—Mary, Anitha, and Diego—join the gang as they travel across the U.S. and halfway around the world in search of adventure.

Use this handy guide to discover what's happening on each episode. Check your local newspaper for the time "3-2-1 Contact" is on in your area.

TROPICS WEEK

MON. SEPT. 23 SNEAKIN' AROUND

Where did your sneakers get their start? Possibly from a tree in the tropical nation of Malaysia. Visit there to find out how milky tree goo is turned into rubber. Then see how that rubber is turned into sneakers.

TUES. SEPT. 24 THAT'S MINE!

How can you turn a pile of dirt into big bucks? Miguel discovers that secret as he visits a tin mine in Malaysia. He'll share the answer with you—but only if you tune in today!

WED. SEPT. 25 THAT'S RICE

Half the world's people eat it as their main diet. There are more than 8,000 varieties of the stuff. That's just two kernels of information you'll discover as you see how rice is grown.

THURS. SEPT. 26 MONKEY BUSINESS

How can you get coconuts off a tall tree without risking your neck? Just train a wild monkey to climb up and throw 'em down. This show takes a look at tame wild animals who work for people.

FRI. SEPT. 27 CALL OF THE WILD

In Malaysia, people are training orphaned orangutans to survive on their own in the wild. You'll get to see a wheelbarrow full of apes.

LIGHT WEEK

MON. SEPT. 30 SUNNYSIDE UP

Visit the world's largest solar telescope in Arizona. Then stare deep into the eyes of many different animals. Can you figure out which eyes belong to which critters? This show may really "surpr-eyes" you.

TUES. OCT. 1 COLORFUL RIDDLES

What's faster than the speed of light? And why are red flowers red and not green or pink or purple? Today you'll find out the answers to these colorful questions.

WED. OCT. 2 EYES RIGHT!

How can you get color on a black and white TV set? This and other tricks will be magically shown to you as an early Halloween treat. Then ready yourself for some serious business as kids take apart a real cow's eye.

THURS. OCT. 3 NOW YOU SEE IT

If you could turn yourself into a lizard, a dog, or a cat, what would the world look like to you? Get down to an animal's level and see all about it.

FRI. OCT. 4 BENDING AND BOUNCING

If you think a prism is a place people are sent if they're guilty of a crime, guess again. Diego and Robin will explain prisms—and how they help save lives—as the two visit a lighthouse along the California coast.

FARMS WEEK

MON. OCT. 7 WILD AND WOOLY

How do you shear a sheep for wool? Very carefully. Watch Miguel and Robin wrestle a sheep to the ground—and then cut its curly locks—in this special yarn.

TUES. OCT. 8 PIG OUT

Move over, Miss Piggy, honey. The most glamorous pig in the world is in for some very heavy competition from a porker named Ralph. Watch him perform a daring "swine dive" as he grunts his way to happiness. Then get set for the latest in PigNews from "oinker persons" Paco and Mary as they really get into their hoggy friends.

WED. OCT. 9 ALL MIXED UP

Visit an animal hospital as Lucky, Paco's mutt, has a check-up. Get the tasty story behind a weird fruit called a limequat. And watch a brangus being born. A what? For the answer, tune in today.

THURS. OCT. 10 A MOO-VING STORY

Mary makes a whirlwind visit to a carousel for cows. If that sounds outrageous, how about this: Did you know



PHOTO: GARY MILLER/CW

that baseball gloves, china and dice all come from one animal? Learn about it in today's show.

FRI. OCT. 11 WHO'S CHICKEN?

Frank Perdue—the king of chicken-raising—takes us on a tour of one of his chicken farms. You'll cluck over hundreds of thousands of chicks being hatched and raised. If you've ever wondered how the feathered critters are raised on a big scale, then this is eggsactly the program for you.

STUFF WEEK

MON. OCT. 14 A HELPING HAND

Miguel, Robin and Kathy get an up-close look at the Statue of Liberty as French and American workers get her ready for her 100th birthday. You'll get to see places where visitors have never been.

TUES. OCT. 15 MUGGING AROUND

Paco is up to his elbows in clay as he searches for the perfect coffee mug for his mother. The search finally leads him to make one of his own.

WED. OCT. 16 SHAPE OF THINGS TO COME

Steel and glass don't have much in common—or do they? The answer may surprise you as you meet a glass-blower creating a delicate piece of work. Then watch some folks making a steel dagger.

THURS. OCT. 17 A REAL HOWL

Who is that masked man? It's none other than Miguel turning into a werewolf. What's that you say? A werewolf! Is Miguel trying to outdo Michael Jackson's "Thriller"? You'll find out—today!

FRI. OCT. 18 STICK AROUND FOR THE YOLKS

Meet some kids who are working on a real puzzle. They've got to design a package that can be dropped 30 feet. Doesn't sound hard? It is—since the contents are raw eggs. And the object is not to break a single one.

Letters

Reader Pleasers

Dear 3-2-1 CONTACT,

How do you know the ways to please us in your articles?

Vasin Laiterrapong
Skokie, IL

Dear Vasin,

We spend a lot of time trying to come up with ways to please you. We visit schools where there are kids about the same age as our readers. We ask them to rate our ideas. We also get letters from kids asking us to please print stories on certain subjects. Also lots of times we put ourselves into your heads. If we were you, what would we like to read about? More often than not, we guess right. You might say we're the world's oldest kids.

CONTACT Fever

Dear 3-2-1 CONTACT,

How many people get your magazine?

Jennifer Koch
Ursa, IL

Dear Jennifer,

Right now more than 300,000 readers are receiving CONTACT magazine. But that's not enough. We'd like the world to read CONTACT.

Write On!

Dear 3-2-1 CONTACT,

Why not let kids write more things for your magazine—like short poems or cute stories.

Meredith Thompson
Burke, VA

Dear Meredith,

We'd love to have enough room in the magazine to print everything our readers write. So we're trying to put more and more of your stuff on the Mail and Letters pages. But since we try to bring

you a packed-with-information issue each month, the only stories and poems we can print are your contest entries. But we do read everything we get from you. And that's lots of good stuff!

Hey Everybody, It's Us!

Dear 3-2-1 CONTACT,

How come you don't talk about the people that make and write 3-2-1 CONTACT magazine?

David F. Mickelbury
Seattle, WA

Dear David,

Would you believe we're shy? If you believe that, maybe we can sell you the Brooklyn Bridge! Actually we've been sitting here, waiting for someone to ask! So for all of you out there, from all of us here...a photo of the CONTACT staff (below).

Program Us

Dear 3-2-1 CONTACT and ENTER,

Are you going to keep having programs for us computer users?

Lauren Charles
New York, NY

Dear Lauren,

We sure are! If you've got any ideas for programs, send them along!

We Want Mail!

Dear Readers,

We really love hearing from you. The questions, ideas, and complaints we get help us make CONTACT a better magazine. So why not drop us a line? We can't answer every single letter, but we do read them all. Send your mail to: 3-2-1 CONTACT

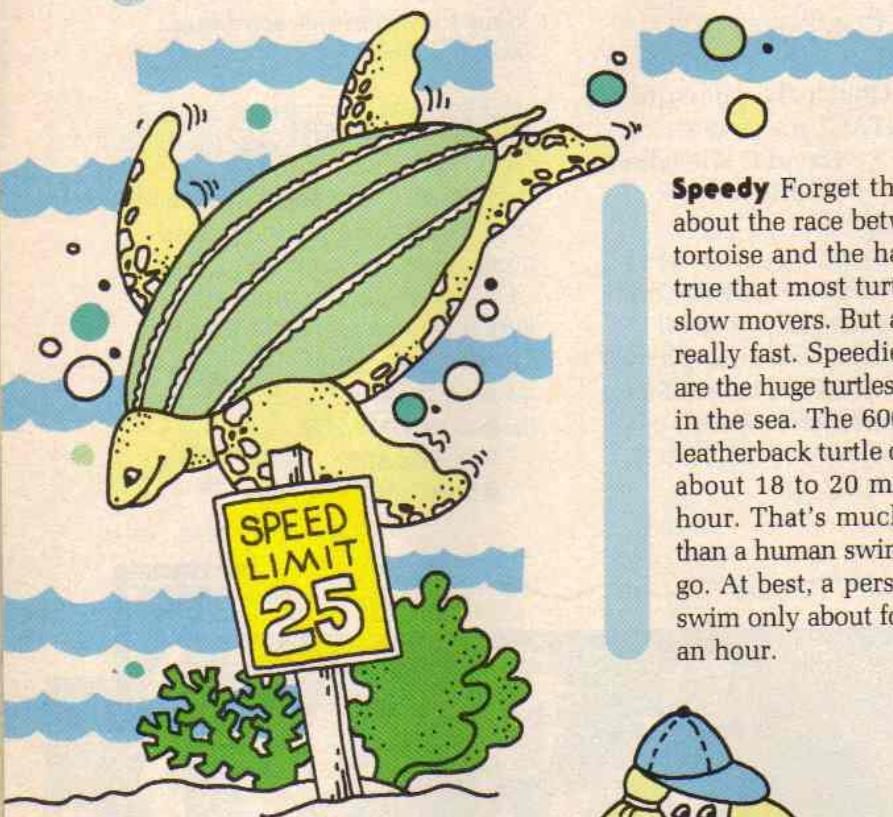
P.O. Box 599
Ridgefield, NJ 07657



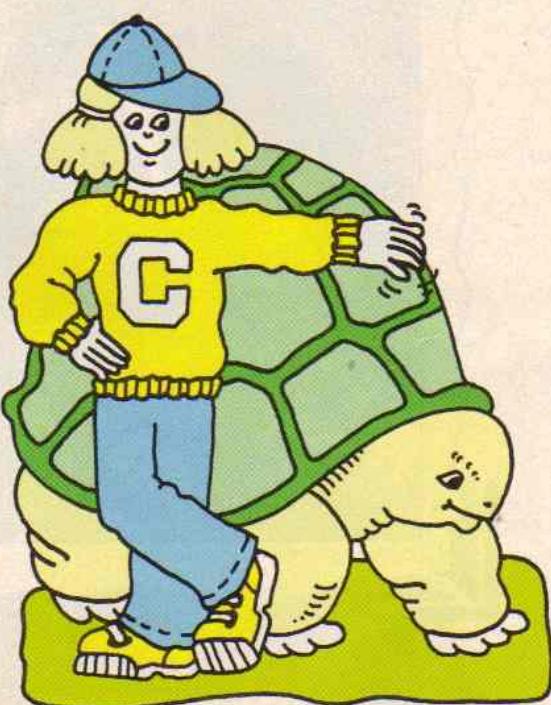
Fool'd Ya! It's really the Marx Brothers.

Turtle Tales

Turtles are really fun to collect. Just ask anyone who works at an aquarium or a zoo! What most people don't know is that turtles have some surprising hidden talents. For instance...

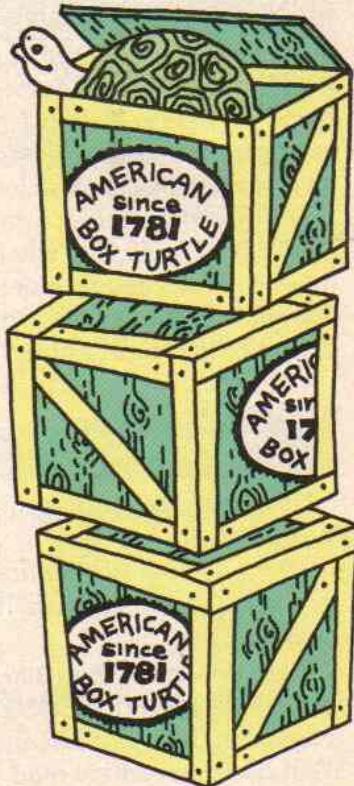


Terrific Tortoises Land turtles are called tortoises. Most of them are small. But a few grow almost as big as the giant turtles from the sea. The Galapagos tortoise weighs about 500 pounds and grows to be four feet long. Sound scary? This tortoise would be even more afraid of you. When it spots people, it often hisses. Then it falls to the ground as if it were dead and waits until the people go away.



Speedy Forget the story about the race between the tortoise and the hare. It's true that most turtles are slow movers. But a few are really fast. Speediest of all are the huge turtles that live in the sea. The 600-pound leatherback turtle can swim about 18 to 20 miles an hour. That's much faster than a human swimmer can go. At best, a person can swim only about four miles an hour.

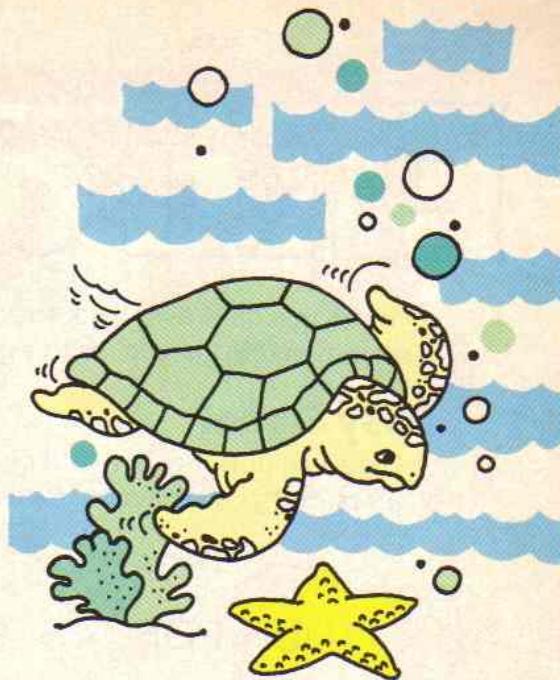
Tasty? You might be surprised to learn that some people actually eat turtles. Long ago, sailors on ships used to catch large turtles to add to their supply of fresh meat. Today, turtles still land in people's cooking pots. They're also used to make—what else?—turtle soup. Like the ridleys, many turtles are becoming very rare. It's against the law to eat these turtles or their eggs.



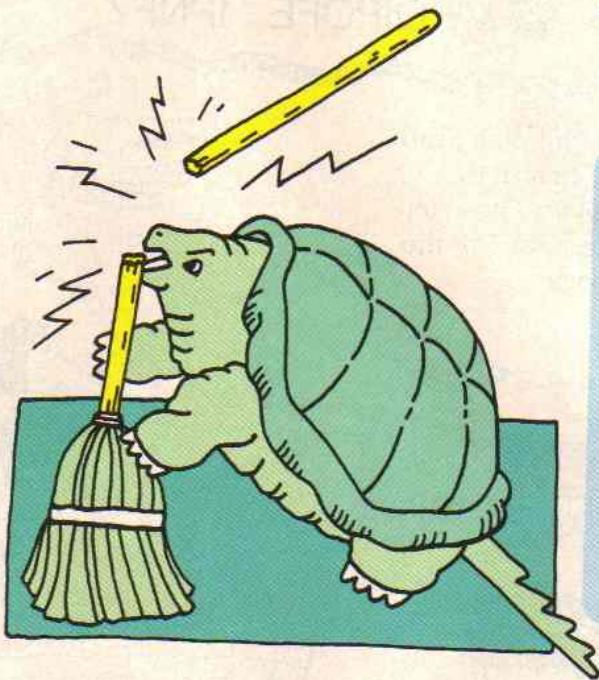
Weird One really weird turtle is the matamata of South America. If you saw one lying in a stream, you might think it was a pile of garbage. It has a flat head covered with movable fringes and ear flaps. Matamatas use these odd-looking pieces of skin to lure small fishes into coming close enough to eat. This turtle also has a long neck, a nose like a snorkel and a flat lumpy shell.



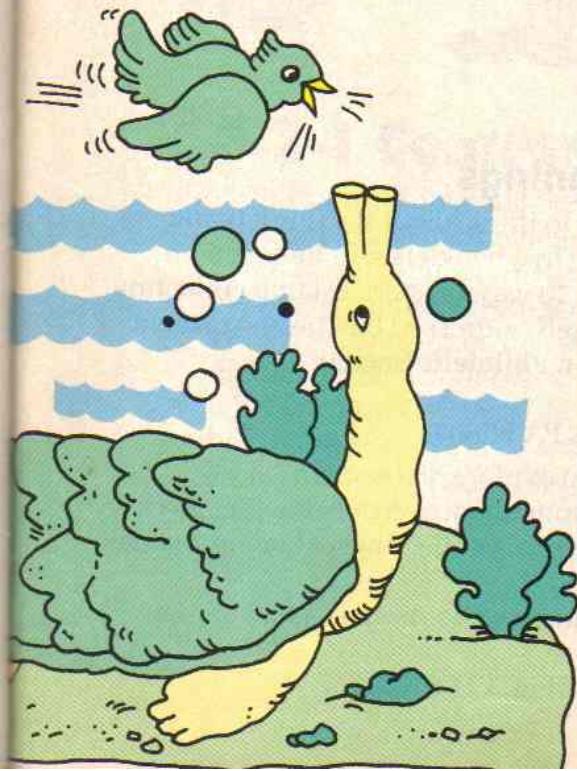
Unsinkable Most turtles can't drown. Even though they breathe air with their lungs, they can also stay underwater a long time. That's because they have two different ways to breathe. Like fish, turtles can take oxygen directly into their bodies from the water. So most turtles don't have to come up to the surface for hours. Some even stay underwater for several days.



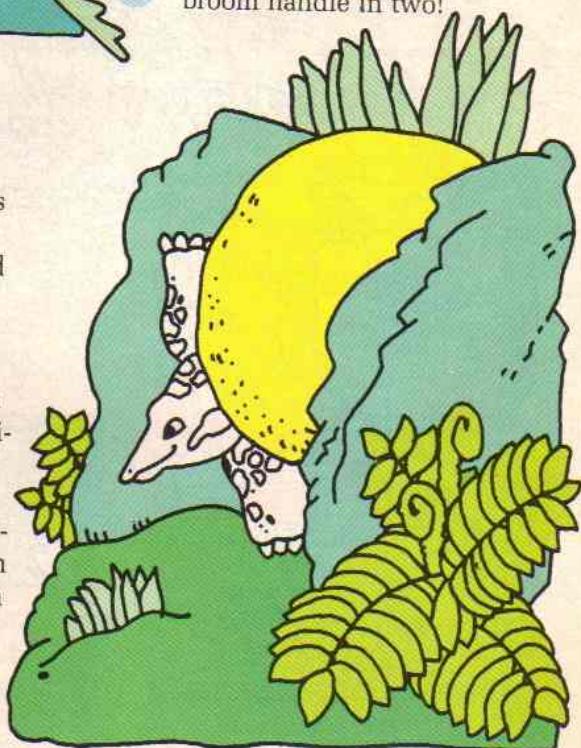
Old Man Turtle People once thought that turtles lived over 200 years. That idea got started because jokers would carve names like "George Washington" on their shells. When other folks saw these turtles, they thought the turtles had been around since Washington's time. Actually, turtles do live longer than most animals. The American box turtle, for example, lives up to 120 years.



Snappers Turtles don't have teeth. But you'd never believe that if one bit you. They do have very sharp ridges in their jaws that work almost as well as teeth for cutting up their food. But the only turtle ever likely to bite you is a snapping turtle. On land, these fierce animals snap at everything that comes near them. Some are so strong that they can even bite a broom handle in two!



Shell-lacking Some turtles don't have a hard shell to protect them. So they find other ways to stay safe. Musk turtles give off a bad smell. That's why they're called "stinkpot." Then there's the softshelled African pancake tortoise. It hides in cracks between rocks. When enemies appear, it takes a deep breath and blows up its body with air. That wedges it safely into its hiding place.



Extra!

by Ellen R.
Mednick

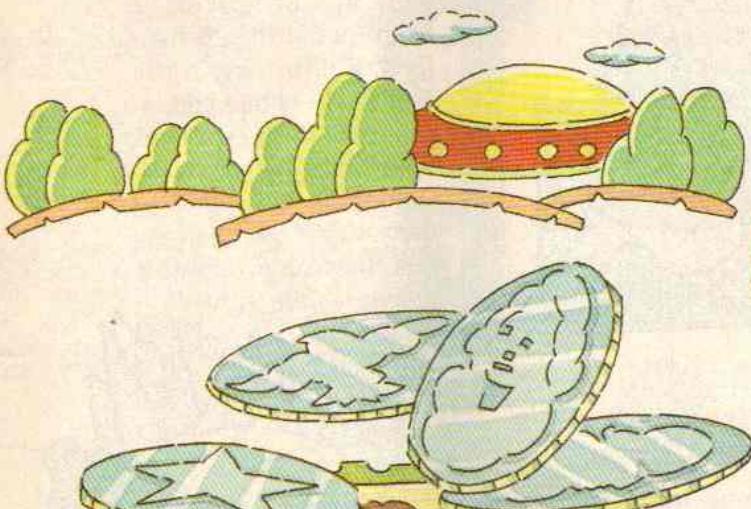
If you're in a daze over back-to-school days, then this EXTRA! is guaranteed to get you off to a good start.

Busy Signal

Here's an out-of-this-world question for some unearthly visitors. But you'll have to use a special code to uncover it.

XIJDI POF PG ZPV QIPOFE IPNF?

To Solve It: Look at each letter. Find the one that appears before it in the alphabet, and write it down. Those letters will spell out the message. For the answer, see the Did It! page.



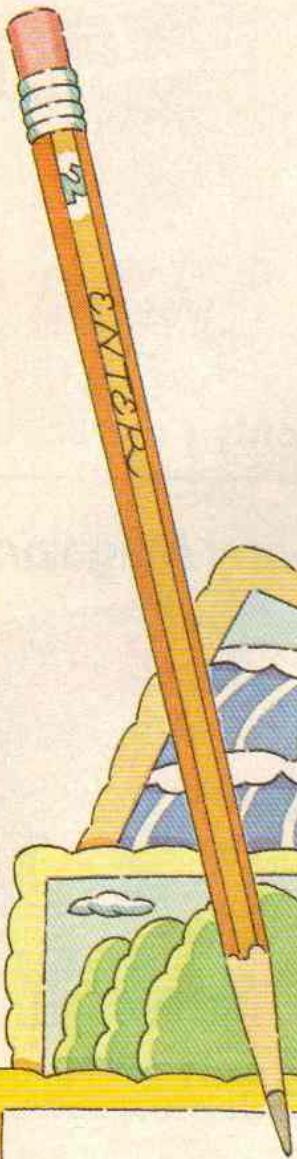
New Beginnings

Now's your chance to think about starting a brand new collection. These free booklets will help you on your way. To find out 10 ways to start a stamp collection, just send a stamped, self-addressed business-size envelope to: **The American Philatelic Society**

P/O 8000
State College, PA 96803

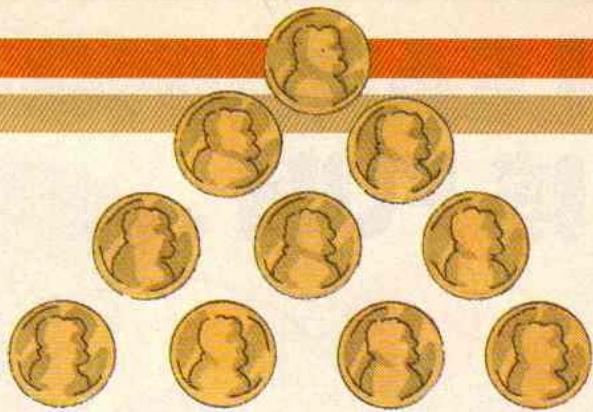
Have you wanted to explore the world of loose change? Well here's your chance. A new booklet gives you an introduction to coin collecting (called numismatics). Just write away to:

American Numismatic Association
P.O. 2366
Colorado Springs, CO 80901

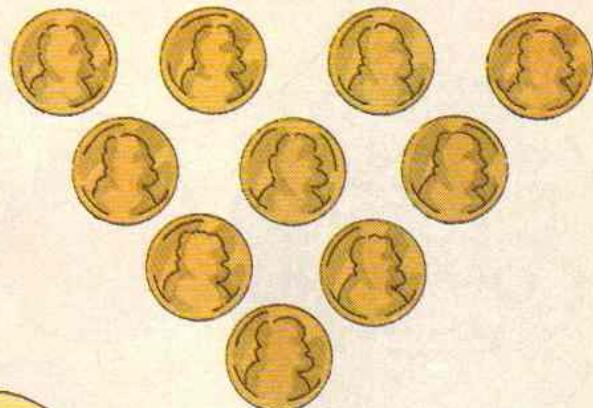


Triangle Trouble

You don't have to collect coins to do this "centsible" trick. Arrange 10 pennies in this triangle shape.



By moving just three pennies, can you turn the triangle upside down so it's just like this? Check the Did It! page for the answer.



3-2-1 Contest

Calling all collectors! Send us a postcard from your hometown. It could be a picture of a restaurant, a park or a landmark from your area. We'll use some of the postcards to make a poster. On the back of the card tell us what you collect. We'll print a few of the best. Winners will get a CONTACT or ENTER T-shirt. Send your entries to:



**3-2-1 Contest:
Collector Cards
P.O. Box 599
Ridgefield, NJ 07657**

Be sure to include your T-shirt size and whether you want an ENTER or CONTACT T-shirt.

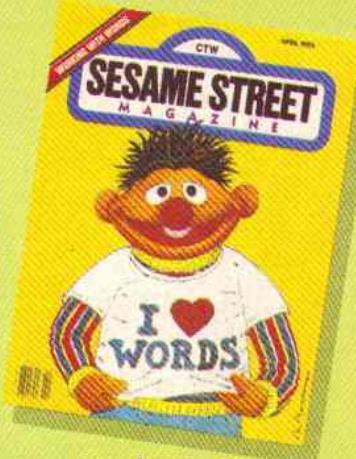
ILLUSTRATIONS BY MICHAEL DONATO

LEARNING IS FUN ...

Sesame Street Magazine

B

ig Bird and his delightful friends bring dozens of playful surprises, ten terrific times a year. (It's the entertaining education that Sesame Street does best!) Puzzles, cut-outs, games, A-B-C's, 1-2-3's...there's all the magic of the TV super-series in every colorful issue.



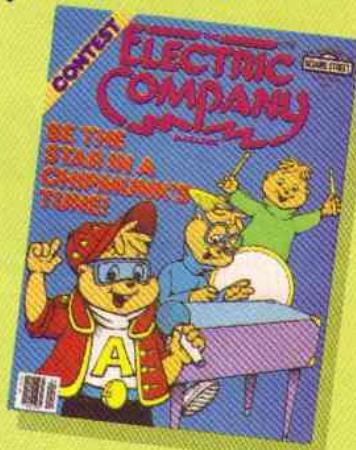
1 year (10 issues) for only \$10.95



The Electric Company Magazine

A

s creatively entertaining as the TV show kids love. It's amusing, playful, absorbing, and educational for beginning and young readers ages 6 to 10. Enjoy ten colorful issues filled with puzzles, games, cut-outs, stories, jokes...and sunny smiles.



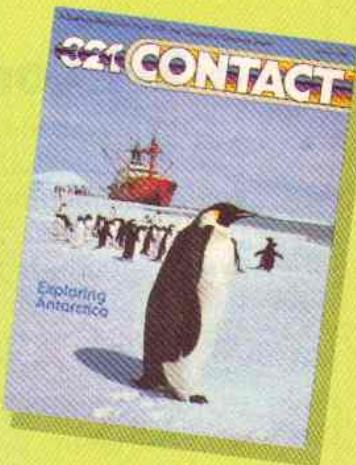
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3-2-1 Contact

A

n entertaining, informative adventure in science and technology for 8 to 14-year-olds. Each of CONTACT's ten big issues is packed with puzzles, projects, experiments, and colorful feature stories. PLUS a new ENTER computer section with programming, news and reviews. A fun, involving way to learn!



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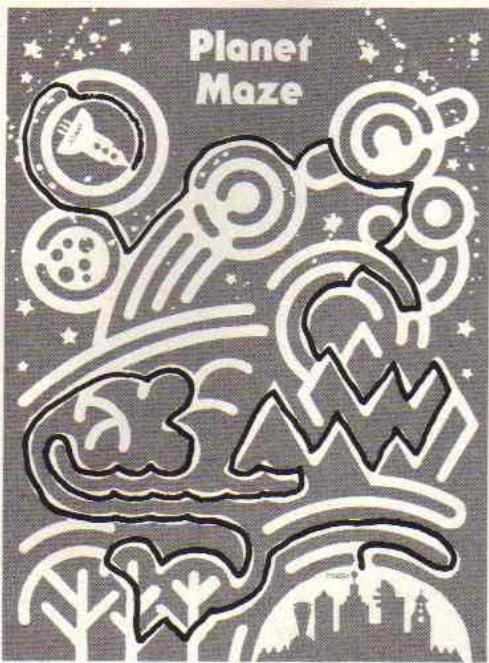


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Children's Television Workshop
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Did It! ID

What's Cookin?

1. Bird is flying upside down. 2. There are no hands on the clock. 3. Records are stacked in the dish drainer. 4. Eggs are popping out of the toaster. 5. Faucet is upside down. 6. Books are in the refrigerator. 7. Football is in the fruit bowl. 8. Glasses filled with milk are upside down. 9. Fish are swimming in the oven. 10. Girl is wearing two different shoes. 11. Calendar dates are backward. 12. Dog is wearing wrist-watch.



Next Month!

Here's a sneak peek at some of what you'll find in the next issue of 3-2-1 CONTACT

Invisible Animals!

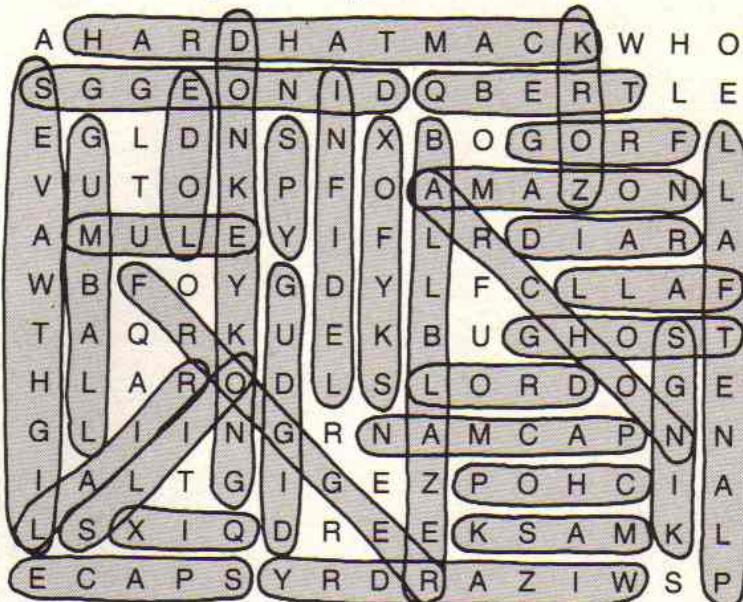
Now you see them. Now you don't. A close look at real animals that seem to disappear.

Robot Factory

CONTACT shows how a band of robot musicians come to life.

Plus ENTER the world of computers and more!

Vanishing Videogames

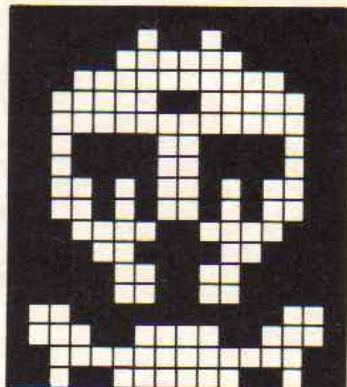


A WHOLE LOT OF QUARTERS.

Space Detectives

Each row of numbers matches a row on the graph paper. Each number tells you how many boxes to fill in or leave blank. For example, in the second row, the numbers are 6, 1, 2, 1, 6. The first 6 boxes are filled in, the next one is left blank, the next 2 are filled in, and so on.

If you did it right, you have Binary's portrait of his alien napper—Picdar the Pitiful!

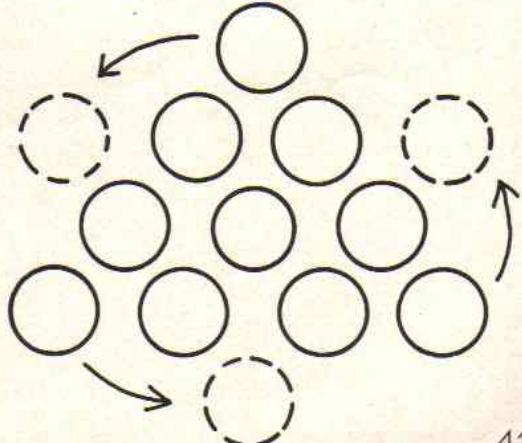


Busy Signal

Which one of you phoned home?

Triangle Trouble

Here's one solution.



Contact Lens



Eye'll Be Seeing You

Are there times when you've wished you could sleep with your eyes open? These tiny owl monkeys have the secret down pat. They look awake and alert. The monkeys' big, wide open eyes make their enemies think the creatures are watching them very closely. So the enemies will scurry away.

But surprise! These South American monkeys are actually fast asleep. Their very dark eyelids look like pupils. This makes their eyes appear to be huge and wide open. It also helps to make the critters—who are about the size of squirrels—appear to be much bigger than they actually are.

It's one way that nature helps protect the gentle owl monkeys from danger.